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ABSTRACT

The oral reading miscue patterns of 26 normal students in grades one, two, and three were compared with those of 26 educable mentally retarded students from primary, intermediate, and junior high school classes. Intelligence quotients ranged from 94 to 137 for the normal students and from 50 to 80 for the retarded students. During the testing sessions, pupils read three selections they had never seen before; their oral reading was tape recorded, and miscues were later recorded and analyzed according to reading miscue inventory criteria. Among the results were that mentally retarded and normal readers displayed similar abilities to utilize sound and graphic cues in decoding unknown words, and that the two groups substituted single words of the same grammatical function to a similar degree. Normal readers, however, appeared to correct more miscues than did retarded readers and to be more proficient in producing grammatically and semantically acceptable structures when reading, while mentally retarded readers showed a tendency to make a greater number of meaning-changing miscues. Normal readers showed a greater tendency to use meaning-based and grammar-based cues and to correct miscues efficiently, while retarded readers tended to use grammar-based cues while often ignoring meaning factors.
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Technical Report No. 469

A COMPARISON BETWEEN ORAL READING MISCUES OF READERS WITH NORMAL INTELLIGENCE AND EDUCABLE MENTALLY RETARDED READERS

by

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Report from the Project on
Studies in Language: Reading and Communication

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ABSTRACT

This study was designed as a preliminary study to investigate the oral reading miscue patterns of normal and educable mentally retarded students reading between the 2.0 and 3.9 grade levels. Thirteen male and thirteen female normal students ranging in age from 7-0 to 8-7 were taken from first, second, and third grade levels from five school districts in southeastern Wisconsin. These normal readers were compared to sixteen male and ten female educable mentally retarded students from ages 9-5 to 16-1, who were selected from primary, intermediate, and junior high school classes. Intelligence quotients ranged from 94 to 137 for the normal students and from 50 to 80 for the retarded students.

Each subject read during one testing session, three selections which he had never seen before. Selections ranged in difficulty from beginning first grade to beginning second grade reading levels. The oral reading of the pupils was tape recorded with the analysis of miscues conducted by the researcher at a later time. Miscues were recorded and analyzed solely by this researcher according to Goodman RMI criteria.

Two major comparisons were made in this study. Comparison I consisted of an analysis of variance which was run between the raw scores of the groups in each

subcategory of the RMI. A t-statistic was applied to determine whether a significant difference existed between the groups. Comparison I provided an inter-group analysis with no consideration for total number of miscues made. Significant differences were found in all categories except Correction-Yes, Correction-Partial, Meaning Change-No, Semantic Acceptability-Yes, Comprehension-No Loss, Grammatical Relationships-Strength, and Grammatical Relationships-Overcorrection.

Comparison II compared subcategory totals to total number of group miscues in each RMI category. The resulting percentages provided an intra-group comparison which offered a more realistic insight into the reading strategies of the groups. The findings of this comparison indicated that the groups displayed similar abilities to utilize sound and graphic cues in decoding unknown words. Also, both groups substituted single words of the same grammatical function to a similar degree. Normal readers, however, appeared to correct more miscues than did retarded readers and appeared more proficient in producing grammatically and semantically acceptable structures.

Mentally retarded readers exhibited a tendency to make a greater percentage of meaning-changing miscues; as a result, they also produced a greater number of structures

which caused partial or complete loss of comprehension.

Normal readers showed a greater tendency to utilize meaning and grammatic cues and to correct miscues efficiently, while retarded readers tended to use grammatic cues while often ignoring meaning factors.

Although differences did exist between the groups, it was apparent that mentally retarded readers were utilizing the reading strategies tapped by the Goodman RMI. The majority of these reading strategies, however, were not used as efficiently by the retarded group as by the normal readers.

Implications of the study center in the areas of reading assessment, teaching methods, and instructional materials. It is evident that an evaluation of reading must not be limited to a mere tallying of deviations from the text, but should also assess the reader's interaction with the language of the text. Direct teaching in the use of language cues in reading appears to be warranted for the retarded with an emphasis upon the individual learning styles of each student. In addition, each reader should be provided the opportunity to utilize reading skills within a meaningful context.

CHAPTER I

Introduction

Psycholinguists (Goodman, 1972; Smith, 1971) indicate that all readers bring an oral language system to the reading process and that reading is an active procedure which involves constant interaction between the reader and the text. Reading success is determined, therefore, by the facility with which a reader utilizes his language ability in selecting minimal syntactic/semantic cues to assess the correctness of his response and ultimately to gain meaning from the passage (Goodman, 1972). It may be inferred that children who experience difficulty in language development will also experience difficulty with reading instruction because of their inability to interact adequately with the language of the passage.

Robinson and Robinson (1965) indicate that the language development of mentally retarded children differs from that of normal children, with language representing a major area of deficiency for the retarded child. Lenneberg (1967) studied the language patterns of a variety of retarded children and concluded that their language develops in patterns similar to patterns of

children with normal intelligence; however, this development proceeds at a slower rate. Supporting Lenneberg's findings were studies conducted by Lovell and Dixon (1967) who found educable mentally retarded children to have speech patterns comparable to normal children of approximately the same mental age. Further substantiation of Lenneberg's premise was presented by Miller and Yoder (1972) who stated, "there is enough correspondence between the growth of language in retarded and nonretarded children to justify a clinician's selective use of the data available on normal language acquisition" (p. 100) in working with retarded children.

Reading is related to language development, as readers use their sense of semantic structures in conjunction with the context cues of the text as a method of testing the appropriateness of their responses to the selection. Beginning readers must receive specific instruction in utilizing their knowledge of language patterns as a foundation for increased reading comprehension. The literature (Jordan, 1969) indicates that reading instruction of mentally retarded children often centers upon either a synthetic-phonics approach or a sight-word approach. These approaches may be adequate to prepare a child with normal intelligence for

comprehension; however, the retarded child experiences difficulty in transferring skills from one task to another or in learning material incidentally (Kirk, 1940; Robinson & Robinson, 1965). It is questionable, therefore, whether an emphasis primarily upon either sight words or decoding is sufficient to prepare the retarded child for meaningful reading. It is possible that an overemphasis upon decoding or sight words as isolated skills may actually hinder a retarded child from developing a meaningful interaction with the language of the selection since his attention will be focused upon the words or sounds in isolation rather than upon thought patterns within the selection.

Because of the relationship between language and reading, an assessment of a child's interaction with the text provides insight in determining his level of reading comprehension. This analysis must go beyond a mere tallying of specific errors and must evaluate miscues according to the seriousness of their interference with meaning. Assuming that the language development patterns of mentally retarded children approach those of normal children and that those language patterns in turn influence reading ability, retarded children could be expected to make the same types of miscues as normal

children who are reading at a similar level. If, however, the retarded children have not had sufficient direct instruction in utilizing their knowledge of semantic structures as an aid to their comprehension of the text, error patterns might reflect an overdependence upon either word calling or phonetic analysis to the detriment of meaningful involvement with the text.

The purpose of this study is to investigate the miscue patterns of educable mentally retarded children and normal children reading between the 2.0 and 3.9 reading levels to determine whether any similarities exist. The findings of this study should provide basic information regarding miscue patterns, the extent of comprehension loss caused by the miscues, and the effectiveness of the reader's use of grammatical relationships in reading. This study is seen as a preliminary study. The findings will generate additional hypotheses in areas of reading miscues, teaching methods, and materials.

Questions to be Investigated

The major question to be investigated by this study is stated as follows:

> Do mentally retarded readers exhibit patterns of oral reading miscues as assessed by the Goodman Reading Miscue Inventory that are similar to those of normal children who are reading within the same range of reading grade levels?

Because the Goodman RMI is composed of nine categories which assess different aspects of oral reading, it is necessary to examine these areas before addressing the major question of the study. In comparing mentally retarded readers with normal readers who read within the same range of reading levels, the subquestions to be investigated are stated as follows:

1. Is there a significant difference in the utilization of graphic cues in decoding unknown words?
2. Is there a significant difference in the use of phonetic cues in decoding unknown words?
3. Is there a significant difference in the match of grammatical function in word substitutions?

4. Is there a significant difference in the frequency of miscue correction?
5. Is there a significant difference in the grammatic acceptability of the miscues produced?
6. Is there a significant difference in the semantic acceptability of the miscues produced?
7. Is there a significant difference in the degree of meaning change caused by the miscues?
8. Is there a significant difference in patterns of comprehension in terms of no loss, partial loss, and loss?
9. Is there a significant difference in patterns of grammatical relationships which result in reading strengths, partial strengths, weaknesses, or over-corrections?

Definition of Terms

For the purpose of this study, the following definitions shall be used in accordance with Goodman's Reading

Miscue Inventory (RMI) (1972) and Wisconsin guidelines for placement of children with exceptional educational needs:

Comprehension patterns

An interrelationship among correction, semantic acceptability, and meaning change produces a pattern which gives insight into whether there has been a meaning loss in the selection because of a specific miscue.

No loss - There has been no loss because of the miscue.

Partial loss - Although the meaning has been changed, it is likely that the reader does gain some meaning from the sentence.

Loss - The miscue has produced a structure from which the reader gains apparently no meaning.

Correction

Although a correction may be made either orally or silently, for the purpose of this study, a reader is credited with a correction only if it is done orally and a portion of the text is repeated.

Yes - The miscue is completely corrected.

Partial - An unsuccessful attempt is made at correction or a correct response is abandoned.

No - No attempt is made at correction.

Educable Mentally Retarded

According to an American Association of Mental Deficiency definition, mental retardation refers to significant subaverage general functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period (Grossman, 1973). School placement of children within this classification is made according to Wisconsin Department of Public Instruction, Division for Handicapped Children guidelines (Kahl, 1967). An individually-administered intelligence test (in this study, the Weschler Intelligence Scale for Children, Weschler, 1949, 1972) rating scales are used with specifications that the intelligence quotient (IQ) fall between 50 and 80.

Grammatical acceptability

This category represents an analysis of the success with which a reader is able to cope with the grammatic structure of the text.

Yes - The miscue results in a sentence which is totally acceptable within the whole text.

Partial - The miscue results in a sentence which is grammatically acceptable but is acceptable only in relation to prior or subsequent sentence portions of the text.

No - The miscue occurs in a sentence that is not grammatically acceptable.

Grammatical function

A comparison between the response of the reader and the expected response is made to determine whether the grammatical function of the two words is the same.

Yes - A word of the same grammatical function is substituted by the reader.

Partial - The miscue is so disrupted or so short a language unit that a grammatical function cannot be assigned.

No - The word substituted by the reader is of a different grammatical function.

Grammatical relationships

An interrelationship among correction strategies, grammatical acceptability, and semantic acceptability gives insight into how concerned the reader is that oral reading sounds like language.

Strength - The reader uses grammatical and meaning cues effectively and makes appropriate use of correction strategies.

Partial strength - The reader uses grammatical cues to the exclusion of meaning cues and does not make appropriate use of correction strategies.

Weakness - The reader does not use grammatical cues, meaning cues, or appropriate correction strategies.

Overcorrection - The reader uses correction strategy when it is inefficient or unnecessary to do so.

Graphic similarity

The degree to which a substituted word physically resembles the expected word is determined with no concern for the pronunciation of the words.

Yes - Two of the three parts of the words are similar.

Partial - One of the three parts is similar to the stimulus word.

No - There is no graphic similarity between the words.

Meaning change

The sentence of the text is read including only the miscue that is being judged, that is to say, no other miscues in the sentence are read. The degree to which the meaning of the text is altered by the miscue is determined.

Yes - An extensive meaning change is involved.

Partial - A minimal change in meaning has occurred.

No - There has been no change in meaning.

Miscues

Miscues are deviations from the text in oral reading which represent not random errors, but errors cued by the thought and language of the reader in his encounter with the written selection.

Normal children

For the purpose of this study, "normal" refers to a student whose intelligence quotient falls above 80 on a test of intelligence and who is not enrolled in a class for the mentally retarded, learning disabled, or emotionally disturbed.

Reading

Reading is a meaningful interaction between the reader and the language of the author.

Semantic acceptability

Semantic acceptability represents the success with which readers produce understandable structures. Because of its dependance upon grammatic acceptability, it is never marked higher than the grammatic acceptability of the miscue classification according to Goodman RMI criteria.

Yes - These miscues are totally acceptable and understandable within the text.

Partial - Miscues which result in acceptable sentences that do not fit into the whole text or which result in acceptability or understandability only with the sentence portion that comes before or after the miscue are placed in this category.

No - These miscues result in totally unacceptable sentences within the reading selection.

Sound similarity

Pronunciation characteristics of words that are substituted by the reader for words of the selection are considered and compared with no concern for the spelling of the words.

Yes - Two of the three portions of the miscue word sound similar to the stimulus word.

Partial - One of the three portions of the words sounds similar.

No - There is no sound similarity between the words.

CHAPTER II

RELATED LITERATURE

The literature pertinent to this study is classified into the following categories: (1) The development of language skills and its relationship to the reading process (Early, 1976; Emans, 1973; Goodman, 1972; Goodman, 1976; Graham & Graham, 1971; Hellman, 1967; Mickelson, 1974; Rupley, 1975; Smith, 1975; Veatch, 1966; Zintz, 1970); (2) A comparison of the language development patterns of mentally retarded students with those of normal children (Anastasiow & Stayrook, 1973; Bliesmer, 1954; Graham & Graham, 1971; Miller & Yoder, 1973; Naremore & Dever, 1975; Spreen, 1965); (3) Utilization of the cloze procedure in determining the use of context cues by mentally retarded and normal readers (Hargis, 1972; Levitt, 1970; Ramanauskas, 1972; Semmel, Barritt, & Bennett, 1970); and (4) A comparison of synthetic and analytic approaches to reading instruction (Neville & Vandever, 1973; Vandever & Neville, 1976). The review of literature in the above categories follows.

Language Development and Reading

Reading, as an integral part of the language arts, is dependent upon language development as both a foundation

and a reinforcement (Smith, 1975). Reading and language theorists (Emans, 1973; Goodman, 1972; Goodman, 1976; Hickelson, 1974; Rupley, 1975; Smith, 1975) indicate that the developmental patterns of language skills and reading skills appear to be somewhat parallel, with several aspects of language development similar to the process of learning to read. Language and reading are both methods of communication--language, primarily through the use of verbal symbols, with reading transforming verbal output into visual symbols.

Language is learned through an interaction with the environment in which perceptions are sampled, categorized, and elaborated upon (Smith, 1975). As this sampling process takes place, a sequential pattern of rule-governed interrelationships is built. An individual's competence in dealing with language depends upon his internalization of these relationships (Graham & Graham, 1971).

Language becomes more complex as individuals mature and increase their ability to generalize language rules. Because all language skills reinforce each other, children are developing a foundation for reading instruction throughout their preschool years as they acquire their language. As a result, reading theorists

(Early, 1976; Goodman, 1972; Heilman, 1967; Rupley, 1975; Smith, 1975; Veatch, 1966; Zintz, 1970) emphasize the need for reading to be based upon the language skills that children possess. As Smith (1975) has stated, "conscious effort should be directed toward making the best possible use of the language skills that children bring to school with them, and to continuously improve all of the language skills as well as reading throughout their school life (p. 402)."

Because of the positive correlation between reading success and language development, it is logical to assume that if a child's language development is adequate, then there is a higher probability that reading skills can be acquired with greater facility. For those, however, who do not have well-developed language skills, learning to read would necessarily be more difficult. Among those who exhibit poor language skills are the mentally retarded (Anastasiow, 1973; Bateman, 1967; Lenneberg, 1967; Robinson, 1965; Spreen, 1965). As a group, the retarded are described as being unable to deal effectively with their language (Bateman, 1967) due in part to their limitations in concept development, rote learning, and the ability to generalize (Schofield, 1972).

Language Development and the Mentally Retarded

Although mentally retarded children, when matched with normal children on the basis of mental age, tend to perform better than normals on measures of vocabulary, the retardates show deficits in their ability to deal with more complex language skills (Spreen, 1965). Vocabulary skills, although highly correlated with intellectual capacity, are also a function of experience; and mentally retarded students, with their greater length of involvement with their environment, appear to have an advantage in vocabulary development over their younger normal counterparts. This is substantiated by Bliesmer (1954) who, on the basis of several criterion--referenced tests of reading skills, found significant differences between normal and mentally retarded children in every category except word meaning.

In spite of the aspect of vocabulary skills, it appears that mentally retarded children do not exhibit the same ability to produce the type of syntactically complex sentences employed by normal children. In a comparative study of the language performance of educable mentally retarded children and normal children at five different mental-age levels, Naremore and Dever (1975) found that there were several factors that discriminated

between the two groups. It appeared that mentally retarded children did not possess the same ability to incorporate several thoughts into one complex sentence structure; however, this was not evident at all mental-age levels. After mental age ten, the normal group displayed greater usage of clauses, while for mental ages six through nine, these syntactic factors did not discriminate significantly between the groups. Based on their findings of an increased complexity of normal verbalizations only past mental age ten, Naremore and Dever indicated that "at younger age levels, there may be few qualitative differences...in the language used by educable mentally retarded and normal children (p. 93)." In discussing implications for the classroom, the examiners suggested that if the language development patterns of retarded children are similar to those of normal children, then similar patterns of instruction could be used with skills being introduced at a slower rate for the retarded.

Findings by Miller and Yoder (1973) concur with the Naremore and Dever (1975) results. In research conducted with the mentally retarded, Miller and Yoder found that the order of grammatic and semantic form acquisition of mentally retarded children was similar to that of normals only at a slower rate of development.

Graham and Graham (1971) noted an increased complexity of the language patterns of retarded subjects which was accompanied by a decrease in their error rate. In their analysis of the sentence patterns of nine male retardates ranging in chronological age from 10 to 18 years, these examiners found that language abilities were related closely to the mental ages of the subjects. From a total of 1,436 spontaneous sentences generated by the subjects, syntactic patterns were analyzed and transformational rules were developed. It was evident from the findings that there was a positive relationship between increased mental age of the subject and his ability to produce a greater number of transformations with a decreasing rate of errors.

In analyzing miscue language patterns, Anastasiow and Stayrook (1973) compared several types of students--black students in kindergarten, first grade, EMR classes, and CA peers of the EMR students. Utilizing a sentence repetition task, the examiners hypothesized that there would be evidence supporting the concept that EMR students have slower language development rates than normals have. Subjects were compared on the basis of their ability to deal with concrete and function words. For the purpose of the study, function words were described as words

indicating sentential relationships between other words or phrases. While retarded students performed in a similar manner to their CA peers on concrete words, the EMR's performed significantly lower than their normal peers on function words. They were, however, similar to the kindergarten and first-grade subjects in this area. This finding suggests that EMR students have mastered concrete words and are able to use them effectively, but are not able to deal as efficiently with the abstractions of function words. The results of this study concur with language theorists who state that EMR students perform better on vocabulary measures when compared to normal students of the same mental age (Spreen, 1965), while displaying a significantly slower development than their normal CA peers in more abstract skills.

Studies Related to Context Cues

An internalization of grammatic and syntactic structures is vital to the development of all language-arts skills (Chomsky, 1973). A knowledge of these skills enables a reader to utilize the context of a reading selection to decode unknown words and to check the accuracy of other word-decoding strategies. Mentally retarded students have a characteristic deficit in this area of context. The extent of this weakness was

investigated in a study conducted by Ramanauskas (1972). Fifty-eight mentally retarded junior high school students reading at above the 2.5 level were tested to determine whether they were able to respond to contextual constraints beyond the sentence level. The students were randomly divided into two groups. Both groups were asked to respond to a cloze test comprised of two stories. One story was presented in natural (NAT) order, while in the other story, the sentence order was modified (MOD). Ramanauskas hypothesized that if mentally retarded students did not use context as an aid to reading, there would be no difference in response to the two selections. If, however, contextual cues were used, performance on the NAT story would be higher than on the MOD story. The results of the study demonstrated a significantly greater number of correct responses on the NAT selection, thus indicating that mentally retarded students appear to use contextual cues in reading, and that these cues extend beyond the sentence level.

Another study conducted by Hargis in 1972 with normal and retarded subjects investigated the use of context cues by both groups. Three variables were studied: (1) the number of exact words supplied, (2) the number of exact words plus the number of grammatically-

correct synonyms, and (3) the number of grammatically-correct synonyms alone. There was no statistically significant difference between the groups of 10 to 13 year old students in their ability to supply exact words missing from the context. Significant differences were apparent in their ability levels when the number of grammatically-correct synonyms were considered. In both of the remaining comparisons, normal students showed a significantly higher ability to supply grammatically-correct synonyms to the context. It appeared, as reported by Hargis, that when the context of the material was strong enough, the retarded subjects were more able to supply correct words; however, when the context was more ambiguous, the retarded students were not as capable as their normal age mates in supplying grammatically-correct responses.

Both institutionalized and public school retarded students were matched with two other groups on the basis of chronological and mental age in a study conducted by Semmel, Barritt, and Bennett (1970). Subjects were required to respond to a cloze task consisting of single sentences which were typed on 4 x 6 cards and read to the subjects. Deleted words were replaced by a tone, and the students were asked to supply the missing words. Five

different types of word order were used in constructing the forty-sentence task. When results were pooled from all groups involved, the examiners found that the non-retarded groups were significantly higher in their ability to perform on the cloze task. It appeared that the position of the deleted word affected the performance of both groups. All groups tended to show greater ability in supplying words deleted from the last position of the sentence; however, normal subjects performed better than retarded subjects. All subjects performed better on sentences with the Adjective-Noun-Verb-Adjective construction, while all subjects performed poorly on Adjective-Adjective-Noun-Verb sentences. It is obvious that sentence structure was a significant factor in the success of all groups. In concluding their study, the examiners stated that EMR children tend to exhibit weak decoding habits and that this weakness is more dependent upon simple associations between words than on grammatical competence.

Levitt (1970) compared the use of context by two groups of mentally retarded children reading at the first-grade level. Forty words were shown to each of the fifty students, once in context and a second time as isolated sight words. It was hypothesized that (1) both groups

would perform significantly higher when the words were presented in context, and (2) that normals would perform significantly higher than retardeds in the context word recognition task. On the context portion of the study, normals achieved a mean error score of 15.88 while retardates had a mean error rate of 15.31. On the Word List portion, the normal group had a mean of 16.92 errors, while the mentally retarded group had a mean of 17.0 errors. Thus, the findings confirmed the hypothesis that context does improve word recognition in both retarded and normal readers. The normals did not, however, perform significantly higher on the task as anticipated. Levitt suggested that this might be due in part to her random method of selecting subjects for the normal group. No intelligence quotient had been obtained for the subjects, but it was merely "assumed" that the students were higher because of their normal class placement. This assumption appeared questionable because the population pool from which the normal group had been selected quite possibly could have been functioning as a group at a lower level of competence. It appears that the results of the study would be more discriminating if a clearer separation between the groups had been obtained. The findings of the study do demonstrate, however, that retarded students

are able to utilize context in decoding words. The results of this study might be applied to the Semmel, Barritt, and Bennett (1970) study. One must ask whether there would have been a difference in the results of that study had the subjects been given the sentences in a larger context rather than as isolated sentences on cards.

Studies Related to Synthetic/Analytic Approaches to Reading Instruction

The use of word analysis cues, both visual and phonetic, is an important skill in identifying unknown words. Goodman (1972) has indicated that proficient readers use graphic/sound cues only when other word analysis systems have failed; however, analysis techniques must be mastered by the reader to place these techniques in the reader's repertoire of reading strategies. Jordan (1969) stated that often reading programs for the mentally retarded emphasize either a sight-word or a phonetic approach to reading. Vandever and Neville have conducted studies to determine which, if either, approach promotes better word recognition and transfer skills in reading. In 1973, thirty pairs of retarded and nonretarded children matched on mental age were taught word lists by either the synthetic or the analytic approach. All words were

composed of letters from a contrived alphabet. After the initial training process, subjects were asked to respond to words made up of the same letters as the original word lists. A multivariate analysis of variance revealed that both retarded and nonretarded groups learned more words through the synthetic approach than through the analytic approach. Also, more effective transfer of training on words consistent with the original training lists was apparent for subjects from both groups taught by the synthetic approach.

A subsequent study conducted by Vandever and Neville (1976) utilized the same teaching system with a contrived alphabet that was used in the 1973 study. One hundred mentally retarded and normal public school subjects were paired on the basis of WISC Vocabulary subtest scores. Transfer skills for words inconsistent with the training list were analyzed. Results indicated that the synthetic approach promoted better word recognition in the initial training session and in transfer to words containing different letters from those of the original training words. Based on the results of their studies, the authors indicated that "if the major goal of early reading instruction is decoding, it is likely that synthetic methods are more effective for both retarded

and nonretarded children (p. 536)."

In discussing the type of reading instruction that is most effective for retarded children, Jordan (1969) has indicated that decoding is not sufficient for developing functional reading skills that will enable the mentally retarded to deal successfully with their environment. The development of comprehension skills cannot be assumed when teaching mentally retarded students, as it often is in reading instruction for normal children. In teaching the retarded, an emphasis upon decoding skills without direct instruction in comprehension will more often than not produce word callers who exhibit a host of characteristics depicting a lack of involvement with the meaning of the text. Jordan describes this type of reading as "expressionless," with a "lack of reaction when a sense destroying error is made" with "little expectation of understanding" what is read (p. 133).

Summary and Discussion

Reading and language theorists appear to concur that there is a positive relationship between language skills and learning to read, with language competence providing the foundation for reading instruction. The language development of mentally retarded children is slower than that of normal children but appears to

develop in the same sequence as reported by Naremore and Dever (1975), Miller and Yoder (1975), Graham and Graham (1971), and Anastasiow and Stayrook (1973).

Because of their slower language development, specific deficits are exhibited by the retarded. They are not as able as their normal peers to produce as many grammatic transformations as reported by Graham and Graham (1971). In addition, there appears to be an ineffective use of function words producing less abstraction in their language (Anastasiow and Stayrook, 1973). These deficits in language affect the ultimate use of language in reading. Several researchers found that mentally retarded students were able to utilize context cues; however, this ability was correlated more closely with mental age rather than chronological age.

Both retarded and nonretarded students appear to learn sight words more effectively if the words are presented in context. In addition, a synthetic approach to reading instruction appears to produce a greater level of sight word recognition and transfer skills for both retarded and normal students. Although the synthetic approach to reading instruction produces better decoding skills, theorists differ regarding the ultimate goal of reading instruction. If reading is defined as a search

for meaning rather than mere decoding, analysis of reading ability must look at the reader's interaction with the language of the selection.

It is the relationship between reading and language that Goodman (1972) attempts to assess in the Reading Miscue Inventory. An analysis of the reader's strategies in dealing with the language of the selection is completed by assessing the reader's ability to use semantic/syntactic cues and sound/symbol relationships in decoding unknown words.

Because of the role that language competence plays in reading development and because of the similarities of language patterns of mentally retarded and normal children, it is possible that similarities also exist in the strategies that both groups use in identifying unknown words. The present study is designed to determine whether similarities do exist in miscue patterns of normal and mentally retarded students reading at a similar reading level.

CHAPTER III

METHOD

The purpose of this study was to determine whether or not any similarities exist in oral reading miscues between educable mentally retarded and normal students who are reading between the 2.0 and 3.9 reading levels. The Goodman Reading Miscue Inventory (1972) was utilized to analyze the miscues made by both groups.

Population

School Districts

Subjects for both groups were selected from the Burlington, Waterford, Union Grove, Raymond, and Oconomowoc school districts, which are located in southeastern Wisconsin. The communities from which the students were chosen include rural-farming, light industry, and "bedroom communities" for work forces in Milwaukee, Racine, Kenosha, Waukesha, and northern Illinois. Community size ranged from approximately 100 to 8,800 according to 1970 census figures, with a mean size of 4,130. These populations encompass a variety of socio-economic groups and are similar to a cross section of the general population.

Four of the school systems included only kindergarten through eighth-grade classes and participated in a union high school district for ninth through twelfth

grades. The other two school districts provided all classes from kindergarten through twelfth grades.

For special education services, five of the districts are served by a County Handicapped Children's Education Board program that provides all exceptional education classes on a county-wide basis. All programs are administered from a central office; however, a county-wide curriculum is not provided. Each school district's special education program is allowed the flexibility to operate somewhat autonomously, choosing materials, methods, and mainstreaming techniques which parallel that district's philosophy. This diversity is representative of the differences generally found among school districts, despite the common county administrative base.

Method of Instruction

Because it was not the purpose of this study to assess the influence of specific instructional methods upon miscues, subjects for both groups were selected from classrooms which represented a variety of approaches to reading instruction and a variety of grade and ability levels.

Subjects for Group I, the normal readers, were selected from seven classrooms: one first grade, four

second grades, one combination second/third grade and one third grade.

One teacher utilized primarily a language-experience approach to reading with supplementary materials chosen from enrichment texts and worksheets. Sixty to ninety minutes per day were devoted to reading in this classroom. The Lippincott series (McCracken & Walcutt, 1966), which emphasizes a phonics approach to reading, was supplemented by workbooks and phonic materials in another classroom. The remaining five teachers used other basal reading series as a basis for their reading instruction. Three used the Macmillan series (Harris & Clark, 1965) with corresponding workbooks as part of a language arts block. Ginn 360 texts (Clymer & Gates, 1969) and workbooks were utilized as the basic materials of the other two classes in ninety- to one-hundred twenty-minute language arts blocks.

Students from nine classrooms comprised Group II, the educable mentally retarded readers. Students were selected from four primary classes, four intermediate classes, and one junior high school class, all of which were housed within public schools. Educable mentally retarded students were enrolled in self-contained classes with one teacher having primary responsibility for each

classroom. Students who were able to function within regular education classes for art, music, physical education, and appropriate academic subjects were mainstreamed. None of the students selected for Group II, however, was mainstreamed for reading, but each received reading instruction within the special education classroom from a teacher certified by the state of Wisconsin in the area of mental retardation.

In two of the special education classes, the language experience approach was utilized with several of the students. Language experience stories were dictated by the students and written for them by their teachers. These stories were used to develop sight-word banks and to provide an introduction to phonics concepts. Supplementary reading materials, workbooks, worksheets, and games were used to reinforce the skills introduced during the language experience stories. Sixty to ninety minutes were devoted to reading instruction daily.

The students of two special education classrooms were given Initial Teaching Alphabet (ITA) (Downing, 1965) instruction. One teacher of the primary level class introduced reading instruction with the Initial Teaching Alphabet. Transition to regular orthography was made in this class. Another teacher at the intermediate level

also provided transition to regular orthography for students requiring additional instruction. She then utilized the Macmillan (Harris & Clark, 1965) and Harper-Row (Evertts & Van Roekel, 1966) basal reading series with paperbacks and worksheets as supplementary materials. Sixty to ninety minutes were provided daily for reading instruction.

One primary level classroom reading program was based on phonics instruction. Worksheets, workbooks, and games were used to introduce and reinforce the synthetic phonics approach to reading, and several reading series and supplementary texts provided the opportunity to reinforce the decoding skills taught. Approximately ninety minutes daily were provided for reading instruction.

A multi-basal reader approach was utilized in the remaining four classrooms. Workbooks and worksheets were used as supplementary materials. Approximately sixty to one-hundred-twenty minutes were given to reading instruction each day in these classrooms.

Selection of Students

District administrators were contacted to identify students with normal intelligence who were reading between the 2.0 and 3.9 grade levels. Goodman (1972) specified that any selection to be used with the RMI should be

difficult enough to generate miscues, but easy enough to allow the reader to proceed independently. Because the reading selections used in the study were at the first-grade and beginning second-grade levels, the 2.0 minimum reading level was designated. According to Heilman (1967), "the end of third grade and the beginning of fourth is often designated as the period of 'independent reading.' There is evidence that some teachers do succumb to the philosophy that the intermediate grades should be characterized by a shift in emphasis from 'learning to read,' to 'reading to learn' in various subject matter areas (p. 307)." The 3.9 maximum level was established to include readers who had not yet reached the "transitional" period of reading instruction.

Since grade placement was not a factor in selection, the students were chosen from grades one, two, and three, and were representative of high, middle, and low reading groups. Initially, students were arbitrarily selected by their classroom teachers in consultation with this examiner as potential subjects for testing. Reading levels for the students chosen were verified by reading subtest scores of the Stanford Achievement Test (1964) cited in their cumulative folders. Those students who did not have a reading score in their folders were

administered the reading subtest, Level I, of the Wide Range Achievement Test (1965) by this researcher. Only those students meeting the 2.0 to 3.9 criterion reading levels of the study were placed in Group I and were subsequently administered the Goodman RMI.

With one exception, intelligence quotients were determined by the use of individually-administered intelligence tests used within the school districts or by the Slosson Intelligence Test (1971), administered by this examiner. The one exception was a student whose I.Q. was based upon the results of the Otis-Lennon (1968), a group intelligence test. No upper limit was placed on the intelligence quotients of the normal readers; however, all I.Q.'s were above eighty, which is the upper limit in Wisconsin for placement in a class for the mentally retarded (Kahl, 1967).

No members of Group I were receiving supportive services for reading disabilities, learning disabilities, mental retardation, emotional disturbance, or speech/language handicaps. None of the normal intelligence group had been considered for referral for any of these services.

Initial eligibility for Group II, educable mentally retarded students, was determined on the basis

of the WISC (Weschler, 1949) or WISC-Revised (Weschler, 1972), both individually-administered intelligence tests given by certified school psychologists. According to eligibility criteria established by the state of Wisconsin (Kahl, 1967), an intelligence quotient between fifty and eighty is a requirement for placement in a class for the educable mentally retarded.

From eligible students in classes for the educable mentally retarded, subjects were selected for the study on the basis of their reading level as determined by group administration of the Metropolitan Achievement Test (MAT) (1972), a skills battery given by the school districts to determine annual achievement levels of EMR students. All students who scored between the 2.0 and 3.9 levels on the Total Reading Score of the MAT were considered eligible for the study. Final selection from eligible students was made by individual teachers in consultation with this examiner. Class placement was not a factor; and students were selected from primary, intermediate, and junior high school classes.

Description of Subjects

The data presented in Table 1 provides a summary of information regarding the two groups compared in this study.

TABLE 1
DESCRIPTION OF SUBJECTS

DESCRIPTION		GROUP I	GROUP II
Population	Males	13	16
	Females	13	10
Reading Level	Range	2.0 - 3.9	2.0 - 3.6
	Mean	3.1	2.8
	s.d.	.7	.5
Intelligence Quotient	Range	94 - 137	50 - 80
	Mean	117.23	71.88
	s.d.	11.17	9.03
Chronological Age	Range	7-0 to 8-7	9-5 to 16-1
	Mean	8-1	12-6
Mental Age	Range	7-9 to 8-7	6-3 to 11-6
	Mean	9-5	9-0

Sixteen male and ten female mentally retarded students were compared with thirteen male and thirteen female normal students in this study. All were reading between the 2.0 and 3.9 reading levels with mean reading scores of 3.1 for the normal group and 2.8 for the retarded group.

Intelligence quotients for the normal group ranged from 94 to 137 with a mean I.Q. of 117.23 and a standard deviation of 11.17. The retarded group ranged from 50 to

80 with a mean I.Q. of 71.88 and a standard deviation of 9.03. With a mean chronological age of 8-1, the normal group ranged in age from 7-0 to 8-7 years. The retarded readers ranged in chronological age from 9-5 to 16-1, with a mean age of 12-6.

Computation involving I.Q. and chronological age factors (I.Q. x C.A.) provided the mental ages of the subjects. Group I had a mental age range from 7-9 to 11-1, with a mean mental age of 9-5 years; while the mentally retarded group ranged from 6-3 to 11-6, with a mean mental age of 9-0 years. Although the mental age of the normal group was slightly higher than that of the retarded group, both mental age means were below 10-0 years. The findings of the Naremore and Dever (1975) study suggest that there are few qualitative differences between the language patterns of normal and mentally retarded children below the mental age of 10-0 years. It could be expected, therefore, that similarities exist between the language patterns of the normal and mentally retarded groups compared in this study.

Administration of Reading Miscue Inventory

Reading Selections

Each subject read during one testing session, three identical selections which he had never seen before.

These selections were taken from Readings for Taping (Goodman & Burke, 1972), a book of passages to be utilized as readings for the Goodman RMI.

To ascertain the levels of reading difficulty of the selections, the examiner used the Fry (1968) formula for estimating readability. Three 100-word passages were randomly selected from each story. An average number of syllables and an average number of sentences per one-hundred words were determined, and the averages were plotted on the Fry Readability Graph (1968).

Selection I, "The Old Man, His Son, and the Donkey," had an average of 110.6 syllables and 11.6 sentences per 100 words. This placed the story at the low first-grade reading level. Selection II, "The Line Down the Middle of the Room" with an average of 119.3 syllables and 14.95 sentences per 100 words, was categorized at the upper grade-one level. The final reading selection, "Bill Evers and the Tigers," was at the low second-grade level with an average of 121 syllables and 13 sentences per 100 words.

According to criteria of the Goodman RMI (p. 20), the selection must be "difficult enough for the student so that reading miscues will be made, but not so difficult that he will be unable to continue independently." To

provide a sufficient number of miscues to be analyzed, each reader had to make a minimum of twenty-five miscues to be eligible for inclusion in the study. Only one subject, a second-grade girl with normal intelligence, was deleted on the basis of too few miscues. Another student was chosen by the second grade teacher to replace the deleted subject to maintain an equal number of students within both groups.

Taping Session

In individual sessions, each subject read orally three identical selections. Before each reading session, this researcher established rapport with the subject and conversed with him to become acquainted with the reader's language patterns. Subsequently, specific directions were given to each reader. All readers were informed of the use of a tape recorder and a stop watch, but these instruments were not emphasized. The rate of reading was not stressed. All subjects were informed that the examiner could not help them during the reading, but that they had three choices if they encountered a word they did not know: (1) they could try to figure the word out, using whatever decoding strategies they were familiar with; (2) they could guess at the identity of the word; or (3) they could skip the word and go on reading. During

the testing session, the readers were encouraged to complete the three selections by a rephrasing of the above cited directions. No other verbal cues were provided by the examiner.

The oral readings were tape recorded with no notations being made at the time of the reading. This allowed the examiner to observe the subject, take note of specific behaviors, and maintain the subject's motivation for reading. This researcher reviewed all tapes at a later time and was the sole evaluater of the reading. The use of a tape recorder provided a more accurate assessment and scoring of the miscues since the examiner was permitted to listen repeatedly to the tapes when making judgments about specific miscues. A continuity of scoring was also permitted since judgments were made by one individual and were not affected by extraneous factors such as rate of reading or student behavior at the time of the testing session.

Evaluation Measure Employed

The relationship between language and reading is often not considered in an assessment of reading skill. Several popular diagnostic reading scales depend upon a mere tallying of errors and a recording of the rate of reading to place the student at a particular reading level.

These diagnostic scales rarely take into account the quality of the errors made and how the errors affect the reader's comprehension. Rather, the scales are simply a quantitative recording of deviations from the text.

Psycholinguists (Fries, 1963; Goodman, 1972; Smith, 1971) view reading as an active interaction between the reader and the language of the author. In accordance with this definition of reading, the Goodman Reading Miscue Inventory is designed to give teachers the opportunity to examine and evaluate this interaction. In the qualitative analysis of deviations from the text provided by the Goodman RMI, miscues are weighted according to their interference with comprehension. An estimation is made of the reader's use of sound/graphic cues, grammatic and semantic factors, and correction measures. The RMI thereby provides an insight into why miscues are made and into the reading strategies that a reader is utilizing in decoding unknown words (Early, 1976).

Four major assumptions upon which the Goodman RMI is based involve the reader, his language patterns, and the experiential background he brings to the reading process. Those assumptions are as follow (Goodman, 1972, pp. 10-13):

1. All readers bring an oral language system to the reading process.
2. All readers bring the sum total of their past experiences to the reading process.
3. Reading materials represent the language patterns and past experiences of the author.
4. Reading is an active language process which involves constant interaction between the reader and the text.

Reading instruction and an assessment of reading skill which are based upon these assumptions would necessarily involve a consideration of (1) the reader's language ability, (2) his use of language cues in reading, and (3) the extent to which the reader successfully interacts with the language of the reading selection to obtain meaning. In meeting these criteria, the Goodman RMI analyzes each miscue to ascertain the reader's use of three cueing systems: (a) the use of semantic cues to check the accuracy of reading, (b) the use of grammatic factors to provide a structure for predicting unknown words, and (c) the use of graphic and/or sound characteristics of words to test the accuracy of word analysis.

A worksheet copy of the reading selection was used by the examiner to record miscues from a tape

recording of the oral reading. The reader's production was recorded as accurately as possible, utilizing the recording system suggested by Goodman (Goodman, 1972, pp. 28-33). Substitutions, omissions, insertions, reversals, and repetitions were considered as miscues.

Once the miscues were recorded, they were entered on the RMI Coding Sheet. All miscues were numbered for accurate reference. Each was then analyzed according to questions involving intonation, sound similarity, graphic similarity, grammatical function, correction, grammatical acceptability, semantic acceptability, and meaning change. When the miscues were coded on the Coding Sheet in the proper categories, interrelationships among the various categories were reviewed according to patterns established by Goodman (1972, pp. 72, 76). Grammatical relationship patterns involved an analysis of the reader's use of correction strategies, grammatic, and semantic acceptability. Comprehension patterns were based on the interrelationships among correction, semantic acceptability, and the amount of meaning change generated by the miscue.

Each of the columns of the inventory was totaled, and the column total was compared with either the total number of single-word substitutions or with the total number of miscues. The comparison produced a percentage

which demonstrated the reader's strategies in identifying unknown words and his involvement with the language and meaning of the text.

Research Design and Procedures

Of the nine categories of the Goodman Reading Miscue Inventory, seven have three subdivisions which categorize the miscues made by the reader. The two categories which deal with interrelationships among the analyses, Comprehension and Grammatical Relationships, have three and four subcategories respectively. In analyzing the data, the number of miscues in each of the resulting twenty-eight categories was totaled for each reader, and an aggregate total in each subcategory was obtained for Groups I and II. Subcategory totals were then compared to either total group miscues or total group substitutions to obtain a group percentage for each subdivision.

An analysis of variance of the aggregate raw scores was run between the groups. A t-statistic was utilized to determine whether a significant difference existed between the two groups in the (a) utilization of graphic cues, (b) utilization of phonetic cues, (c) substitution of grammatically similar words, (d) correction strategies, (e) grammatic acceptability of miscues,

(f) semantic acceptability of miscues, (g) meaning change, (h) comprehension levels, and (i) patterns of grammatical relationships.

To obtain a more meaningful interpretation of the data, in addition to comparing the means of the two groups, the percentages of each subcategory were considered. Often, when only the means were compared, the groups did not appear to differ significantly; but when the subcategory totals were compared to the total number of miscues of each group and percentages were derived, it was apparent that reading strategies differed. Both the analysis of variance and the comparison of group percentages were used, then, in the interpretation. These analyses of data are presented in Chapter IV of this study.

CHAPTER IV

ANALYSIS AND DISCUSSION

The analysis of reading miscues used in the Goodman Reading Miscue Inventory provides an insight into the interaction which occurs between the reader and the language of the text. The major question of this study deals with this interaction and compares the oral reading miscue patterns of normal and educable mentally retarded readers to determine whether or not similarities exist.

In the RMI, each miscue made by the reader is evaluated in terms of nine categories outlined by Goodman (1972). Prior to answering the major question of the present study, it is necessary to compare the groups in each of the nine categories of the RMI to determine whether specific reading strategies differentiate mentally retarded and normal children. It is through an analysis of these individual comparisons that the major question of this study can be answered.

Two comparisons are made between the groups in each of the categories of the RMI utilized in this study. Comparison I is an inter-group comparison in which a t-statistic is applied to aggregate group means in each subcategory to determine whether significant differences

exist between the groups. Comparison II is an intra-group analysis which compares the aggregate group totals of each subcategory to the total number of miscues or substitutions made by each group. This analysis produces percentages which provide an insight into the reading strategies used by the groups.

The elements of the RMI that are utilized in this study are the following: total miscues, substitutions, graphic similarity, sound similarity, grammatical function, correction, grammatical acceptability, semantic acceptability, meaning change, comprehension, and grammatical relationships. Two categories of the RMI, dialect and intonation, were dropped because of insufficient data.

Because of the organization of the study, Chapter IV is divided into two main sections. The first deals with the analysis of miscues as it relates to the subquestions cited in Chapter I. The second synthesizes the results of these analyses to address the major question of the study.

Total Miscues

The total number of miscues provides the basis for all other comparisons in the Goodman RMI. There was a significant difference ($p < .01$) between the groups in this category. It is evident from the distribution of the

groups shown in Table 2 that the mentally retarded group made substantially more miscues than the normal readers. The normal readers made a total of 1,058 miscues with a mean of 40.69 and a standard deviation of 11.09, while the mentally retarded readers made 1,494 miscues with a mean of 57.46 and a standard deviation of 32.07.

TABLE 2
CUMULATIVE GROUP PERCENTAGES
TOTAL MISCUES

READERS / CUM. %	NUMBER OF MISCUES											** MEAN	S.D.
	25/35*	36/45	46/55	56/65	66/75	76/85	86/95	96/105	106/115	116/125	126/135		
GROUP I READERS	11	6	7	1	1							40.69	11.09
GROUP I CUM. %	42.3	65.4	92.3	96.2	100.0								
GROUP II READERS	8	6	2	2	1	1	3		1	1	1	57.46	32.07
GROUP II CUM. %	30.8	53.8	65.4	69.2	73.1	76.9	88.5		92.3	96.2	100.0		

*Begins at 25, the minimum number of miscues specified by Goodman RMI.
**A significant difference was found between the groups at the .01 level.

In addition to making a greater number of miscues, the retarded group appeared to be more heterogeneous than the normal group. While ninety-six percent of the normal group made between 25 and 65 miscues, only sixty-nine percent of the retarded group fell within this range, with the remaining thirty-one percent of the retarded group scattered between 66 and 135 miscues.

Substitutions

In the analysis of miscues in the first two categories of the Goodman RMI, graphic similarity and sound similarity, the stimulus word and the reader's

response were considered. Each was divided into three parts, beginning, middle, and end; and the degree of similarity between the two words was determined. In the third cagetory, grammatical function, the reader's response was compared to the stimulus word to determine whether the words were of the same grammatical class. Because of the nature of the above comparisons, only single-word substitutions were considered in these categories.

Fifty-three percent, or a total of 560 miscues were single-word substitutions made by the normal readers. On the other hand, seventy-three percent, or 1,084 miscues, made by the mentally retarded readers involved single-word substitutions.

Graphic Similarity

QUESTION 1: Is there a significant difference in the utilization of graphic cues in decoding unknown words?

A comparison was made in the Graphic Similarity category of the Goodman RMI between the stimulus word and the single-word substitution to assess the similarity or dissimilarity of orthographic characteristics of the two words with no consideration of pronunciation. The summary of group data related to Question 1 which is presented in Table 3 reveals a significant difference between the

groups in all subcategories, based upon a comparison of total group means.

TABLE 3
SUMMARY OF GROUP DATA
GRAPHIC SIMILARITY

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	11.08	21.92	6.75	11.00	1-24	7-53	*
Partial	5.46	12.23	3.69	11.06	1-13	2-44	.01
No	5.00	7.58	3.17	5.47	1-13	1-18	.04

*Significant difference found beyond .01 level.

Graphic Similarity - Yes

Substituted words with two or more graphically-similar elements were placed in this subcategory. A significant difference beyond the .01 level was found between the groups. Normal readers had a mean score of 11.08 with a standard deviation of 6.75. Mentally retarded readers, on the other hand, had a mean score of 21.92, with a standard deviation of 11.0. It is apparent from the comparison of group curves presented in Figure 1 that the normal group performed more homogeneously with a range from 1 to 24 while the mentally retarded readers had a more diverse spread of scores from 7 to 53 miscues.

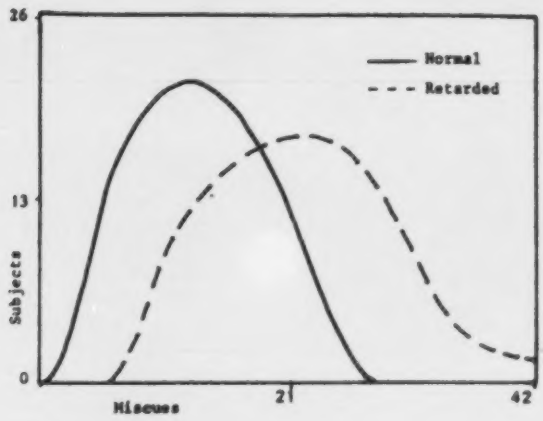

FIGURE 1
COMPARISON OF GROUP CURVES
GRAPHIC SIMILARITY - YES

The divergence between the groups is further demonstrated in Table 4. Fifty-three percent of the normal group clustered between 1 and 9 graphically-similar miscues. The mentally retarded readers were more diverse with approximately forty-five percent of the group scoring between 7 and 20 miscues.

TABLE 4
CUMULATIVE GROUP PERCENTAGES
GRAPHIC SIMILARITY - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
Group I Readers	5	9	6	3	2							11.08	6.75
Group I Cum. %	19.2	53.8	76.9	88.5	100.0								
Group II Readers		3	6	3	7	3		2	1		1	21.92	11.0
Group II Cum. %		11.5	34.6	46.2	73.1	84.6		92.3	96.2		100.0		

*A significant difference was found between the groups beyond the .01 level.

Graphic Similarity - Partial

There was a significant difference between the two groups at the .01 level in the area of substituted words with one graphically similar element. Group I had a mean score of 5.46 and a standard deviation of 3.69, compared to the 12.23 mean and 11.06 standard deviation of Group II. In Figure 2, the normal group curve is skewed to the left, showing a greater clustering of scores around the mean. The retarded group curve is also skewed to the left, but reveals a much greater diversity of scores.

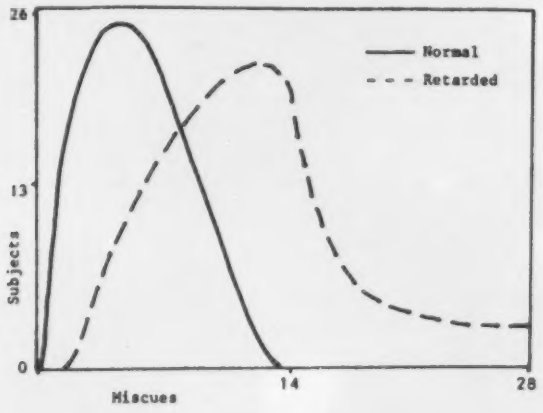

FIGURE 2
COMPARISON OF GROUP CURVES
GRAPHIC SIMILARITY - PARTIAL

This diversity is further substantiated in Table 5. Ranging from 1 to 13 miscues, eighty percent of the normal readers clustered between 1 and 8 miscues. Compared to Group I's relatively small range, Group II

readers were spread from 2 to 44 miscues with fifty percent of the readers falling between 1 and 7 miscues with the remaining fifty percent scattered randomly from 8 to 44.

TABLE 5
CUMULATIVE GROUP PERCENTAGES
GRAPHIC SIMILARITY - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
Group I Readers	17	4	5										
Group I Cum. %	65.4	80.8	100.0									5.46	3.69
Group II Readers	10	4	5	2	1	2	1		1				
Group II Cum. %	38.5	53.8	73.1	80.8	84.6	92.3	96.2		100.0			12.23	11.06

*A significant difference was found between the groups beyond the .01 level.

Graphic Similarity - No

Miscues with no graphically similar parts were not as prevalent as were words with one or more similar elements for either Group I or Group II. Neither of the groups appeared to disregard the graphic characteristics of the stimulus word in decoding, as was indicated by the low incidence of words in this category. A significant difference was found between the groups at the .04 level; however, the group curves shown in Figure 3 appear to be somewhat similar.

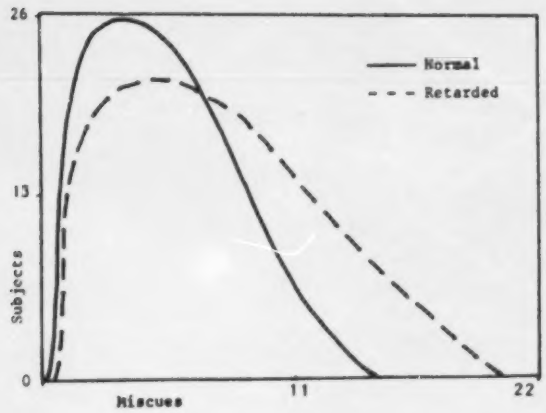

FIGURE 3
COMPARISON OF GROUP CURVES
GRAPHIC SIMILARITY - NO

The mean and standard deviation of the normal group were 5.0 and 3.17, while those of the mentally retarded group were 7.58 and 5.47. Group I had a range of 12 with sixty-one percent of the group falling between 1 and 5 miscues. Group II ranged from 2 to 19, with sixty-nine percent of the group between 1 and 10 miscues. The summary of the distribution of group percentages provided in Table 6 substantiates the similar range of miscues in this category.

TABLE 6
CUMULATIVE GROUP PERCENTAGES
GRAPHIC SIMILARITY - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	16	9	1									5.0	3.17
GROUP I CUM. %	61.5	96.2	100.0										
GROUP II READERS	12	6	4	4								7.58	5.47
GROUP II CUM. %	46.2	69.2	84.6	100.0									

*A significant difference was found between the groups at the .04 level.

Intra-group Comparison:
Graphic Similarity

An inter-group comparison indicated that the mentally retarded readers made more miscues than the normal readers and also performed more heterogeneously than the normal group in all areas of graphic similarity. This diversity of abilities has been consistently reported in literature on mental retardation and was confirmed by the findings of this study.

If one were to consider each of the subcategories of Graphic Similarity separately, it would appear that there was a significant difference between the groups of mentally retarded and normal readers in their use of graphic cues as a reading strategy in identifying unknown words. It is necessary as part of the analysis of the Goodman RMI that each subcategory total is compared to the total number of substitutions made by the reader. This comparison provides percentages which reveal the extent to which graphic cues are used by the reader. When one examines the intra-group percentages in this study, it is evident how strikingly similar both groups were in their use of graphic cues. This similarity is illustrated in Figure 4.

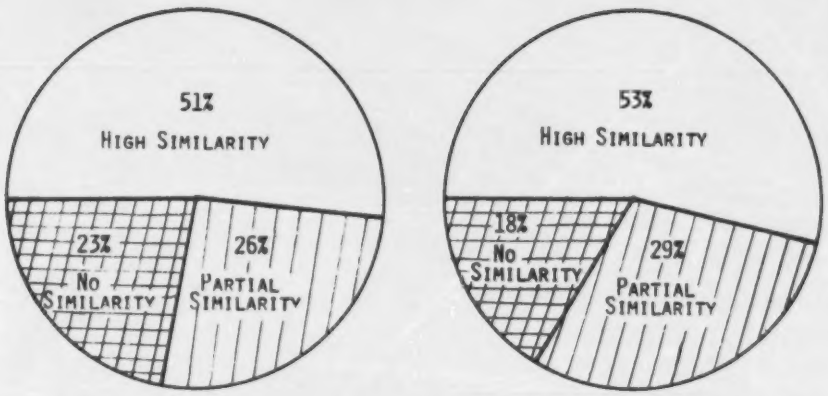

FIGURE 4
INTRA-GROUP PERCENTAGES
GRAPHIC SIMILARITY

Both groups displayed a similar ability to substitute words with a high degree of graphic similarity with 51 percent and 53 percent of total group miscues in this category. It is interesting to note that the normal group had a slightly higher percentage of words falling in the "no similarity" subcategory. This finding could be indicative of the emphasis upon analysis of words which is prevalent in many classes for the mentally retarded.

The results of the intra-group comparison substantiated the findings of Vandever and Neville (1973, 1976) who stated that both normal and mentally retarded readers were able to learn word lists and transfer their training more effectively when taught by the synthetic

approach than when the analytic approach was used.

Sound Similarity

QUESTION 2: Is there a significant difference in the use of phonetic cues in decoding unknown words?

As in the category analyzed above, sound similarity dealt with single-word substitutions which were compared solely on the basis of phonetic characteristics of the words with no consideration for orthographic similarity. The summary of group data presented in Table 7 shows a significant difference between the groups in all areas when aggregate group means were compared. Both groups exhibited a positive ability to utilize sound cues to identify unknown words. This was revealed by the comparatively low number of miscues in the "Sound Similarity - No" category.

TABLE 7
SUMMARY OF GROUP DATA
SOUND SIMILARITY

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	8.85	18.31	5.88	8.26	1-12	5-36	*
Partial	7.42	14.42	3.99	12.53	2-15	3-45	.01
No	5.27	9.00	3.27	6.70	1-13	0-28	.01

*Significant difference found beyond .01 level.

Sound Similarity - Yes

An inter-group comparison revealed a significant difference beyond the .01 level between the groups in the substitution of words that have two or more portions that are similar in sound to the stimulus word. Group I had a mean score of 8.85, a standard deviation of 5.88, and a range of 20. Group II appeared to be more heterogeneous with a mean of 18.31, a standard deviation of 8.26, and a range of 31. A comparison between the group curves presented in Figure 5 shows a greater homogeneity in the normal group and a higher concentration of miscues at a lower frequency for both groups.

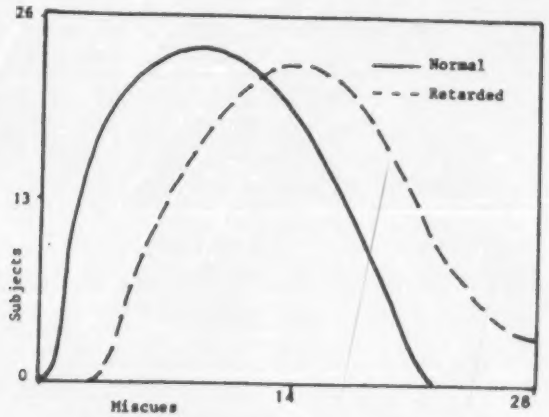

FIGURE 5
COMPARISON OF GROUP CURVES
SOUND SIMILARITY - YES

The summary of the cumulative percentages presented in Table 8 shows eighty percent of Group I falling between

0 and 15 miscues, while eighty percent of Group II had a slightly greater range from 6 to 25 miscues. This substantiates the findings revealed in Figure 5.

TABLE 8
CUMULATIVE GROUP PERCENTAGES
SOUND SIMILARITY - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	11	8	2	4	1							8.85	5.88
GROUP I CUM. %	42.3	73.1	80.8	96.2	100.0								
GROUP II READERS		4	6	6	5	2	2	1				18.31	8.26
GROUP II CUM. %		15.4	38.5	61.5	80.8	88.5	96.2	100.0					

*A significant difference was found between the groups beyond the .01 level.

Sound Similarity - Partial

In this category, Group I had a mean score of 7.42 with a standard deviation of 3.99, while Group II differed significantly at the .01 level with a mean of 14.42 and a standard deviation of 12.53. The difference in the ranges of the groups revealed that again, Group II was more heterogeneous with a range of 42 compared to Group I's range of 13. This diversity is substantiated by the comparison of group curves presented in Figure 6. It is apparent that Group I readers were clustered at a lower frequency, while Group II's range was much greater.

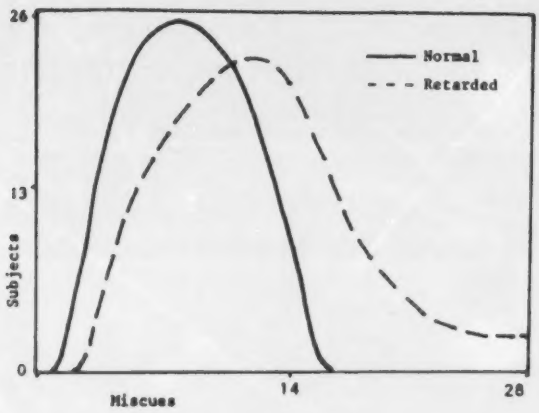

FIGURE 6
COMPARISON OF GROUP CURVES
SOUND SIMILARITY - PARTIAL

While 100 percent of Group I fell between 0 and 15 miscues, it is evident from the summary presented in Table 9 that Group II represented a greater variability with thirty-one percent of the retarded readers making more than 15 miscues in this category.

TABLE 9
CUMULATIVE GROUP PERCENTAGES
SOUND SIMILARITY - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	9	11	6									7.42	3.99
GROUP I CUM. %	34.6	76.9	100.0										
GROUP II READERS	7	7	4	2	1	1	1	2	1			14.42	12.53
GROUP II CUM. %	26.9	53.8	69.2	76.9	80.8	84.6	88.5	96.2	100.0				

*A significant difference was found between the groups at the .01 level.

Sound Similarity - No

A significant difference was found between the groups at the .01 level in this category dealing with

substituted words which did not contain any sounds that resembled the stimulus word. As in the category, Graphic Similarity - No, it was apparent that most readers did not disregard the use of sound cues in decoding words; therefore, the incidence of miscues was somewhat lower in this category than in categories depicting the use of sound cues as a reading strategy. A comparison between the group curves is presented in Figure 7.

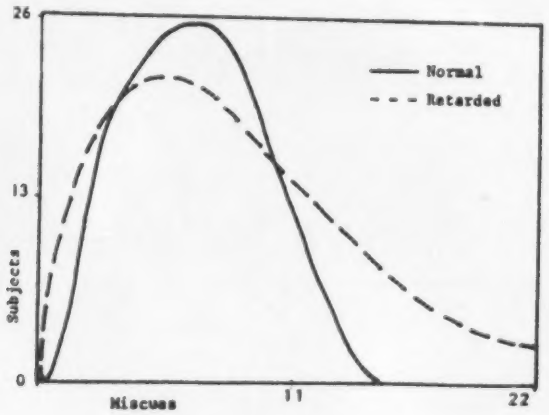

FIGURE 7
COMPARISON OF GROUP CURVES
SOUND SIMILARITY - NO

The difference in group performance is apparent. Group I, with a mean of 5.27 and a standard deviation of 3.27, ranged from 1 to 13 miscues. The wider 28-point range of Group II, as well as the mean of 9.0 and standard deviation of 6.7, substantiated that Group II readers represented a greater diversity of abilities than those of Group I. This

diversity is also shown in Table 10. Approximately ninety-two percent of the normal group fell between 0 and 10 miscues, while only 61.5 percent of the retarded readers had miscues in this range. Ten Group II readers made more than ten miscues which were not similar in sound to the stimulus word, suggesting a greater tendency of the retarded readers to disregard sound cues in identifying unknown words.

TABLE 10
CUMULATIVE GROUP PERCENTAGES
SOUND SIMILARITY - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN *	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	18	6	2									5.27	3.27
GROUP I CUM. %	69.2	92.3	100.0										
GROUP II READERS	9	7	5	4		1						9.0	6.7
GROUP II CUM. %	34.6	61.5	80.8	96.2		100.0							

* A significant difference was found between the groups at the .01 level.

Comparison of Group Percentages: Sound Similarity

An intra-group comparison of the use of sound similarity cues in identifying unknown words again revealed a distinct similarity between the normal and mentally retarded readers of this study. Seventy-six percent of the normal readers and seventy-eight percent of the mentally retarded readers substituted words that had at least one portion similar in sound to the stimulus word.

A complete comparison of group percentages is found in Figure 8.

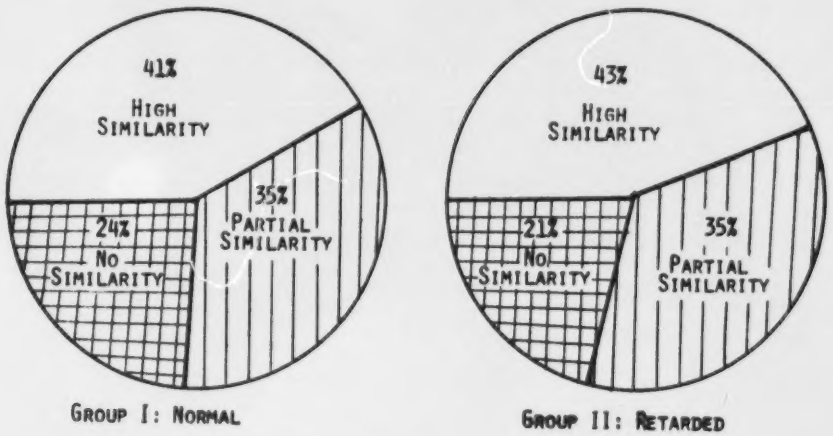

FIGURE 8
INTRA-GROUP PERCENTAGES
SOUND SIMILARITY

This finding substantiated Vandever and Neville's findings (1973, 1976) regarding the use of analytic/synthetic approaches to reading instruction. The results of their studies indicated that although analytic approaches were not as effective as synthetic approaches, both mentally retarded and normal subjects were able to utilize analytic techniques in identifying unknown words. In the present study, it was evident, from a combination of the results in the sound similarity and graphic similarity categories of the Goodman RMI, that normal and retarded readers utilized both sound and graphic cues in analyzing words, and that they were utilizing these cues to a similar degree.

Grammatical Function

QUESTION 3: Is there a significant difference in the match of grammatical function in word substitutions?

This category involved only with miscues which were single-word substitutions. The substituted word was compared to the stimulus word of the selection to determine whether they were of the same grammatical function. An analysis of this category gave a picture of the reader's ability to utilize his knowledge of grammatical structure in limiting the types of words that could be substituted in a particular sentence.

The summary of data presented in Table 11 reveals a significant difference between the groups in all subcategories. Both groups had a comparatively small number of miscues falling in the "Partial" category, indicating that neither group tended to produce miscues for which the grammatical function could not be determined.

TABLE 11
SUMMARY OF GROUP DATA
GRAMMATICAL FUNCTION

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	15.92	29.19	7.72	14.14	6-33	5-59	*
Partial	.46	2.46	1.03	3.86	0-4	0-13	.01
No	5.15	10.08	3.33	8.41	0-14	1-33	.01

*Significant difference found beyond the .01 level.

Grammatical Function - Yes

There was a significant difference beyond the .01 level between the two groups studied. The normal readers had a mean score of 15.92 with a standard deviation of 7.72. Group II represented a greater range of abilities with a mean score of 29.19 and a standard deviation of 14.14. Group II's range of 54 was double the 27-point range of Group I. This diversity between the groups is illustrated in Figure 9.

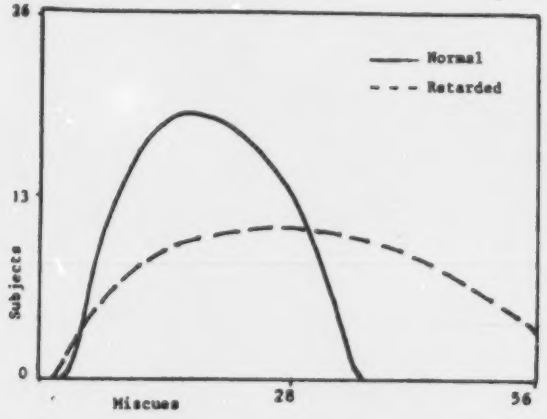

FIGURE 9
COMPARISON OF GROUP CURVES
GRAMMATICAL FUNCTION - YES

The summary of group percentages given in Table 12 further illustrates the heterogeneity of Group II. Eighty-eight percent of the normal group clustered between 6 and 25 miscues that had the same grammatical function as the stimulus word of the text. In comparison, eighty-eight

percent of Group II ranged from 0 to 45 miscues in this category.

TABLE 12
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL FUNCTION - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-60		
GROUP I READERS		6	9	4	4	2	1					15.92	7.72
GROUP I CUM. %		23.1	57.7	73.1	88.5	96.2	100.0						
GROUP II READERS	1		4	4	3	4	2	1	4	1	2	29.19	14.14
GROUP II CUM. %	3.8		19.2	34.6	46.2	61.5	69.2	73.1	88.5	92.3	100.0		

*A significant difference was found between the groups beyond the .01 level.

Grammatical Function - Partial

In this category, only words for which a grammatical function could not be determined were considered. Because of the nature of the category, the incidence of miscues in this area was lower than the other two Grammatical Function subcategories. Despite the low number of miscues in this classification for both groups, a significant difference was found at the .02 level. Group I had a mean of .46 and a standard deviation of 1.03, while Group II had a higher mean of 2.46 with a standard deviation of 3.86. The comparison between the group curves shown in Figure 10 substantiates the low incidence of miscues in this category and the homogeneous performance of Group I.

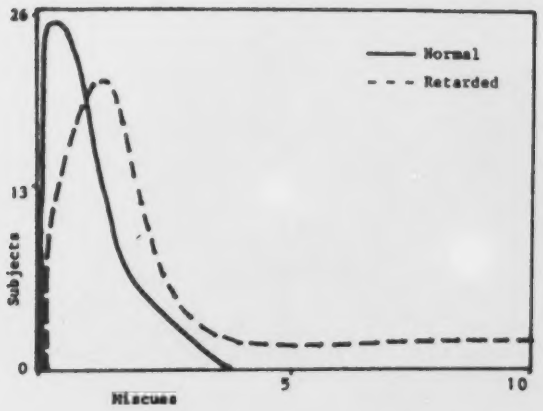

FIGURE 10
COMPARISON OF GROUP CURVES
GRAMMATICAL FUNCTION - PARTIAL

The summary of cumulative percentages presented in Table 13 further illustrates the performance of the groups.

TABLE 13
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL FUNCTION - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	26											.46	1.03
GROUP I CUM. %	100.0												
GROUP II READERS	21	3	2									2.46	3.86
GROUP II CUM. %	80.8	92.3	100.0										

*A significant difference was found between the groups at the .01 level.

Grammatical Function - No

Word substitutions which did not match the grammatical function of the cue words were classified in this category. A significant difference was found beyond the .01 level between the groups. This difference is illus-

trated in the comparison of group curves presented in Figure 11.

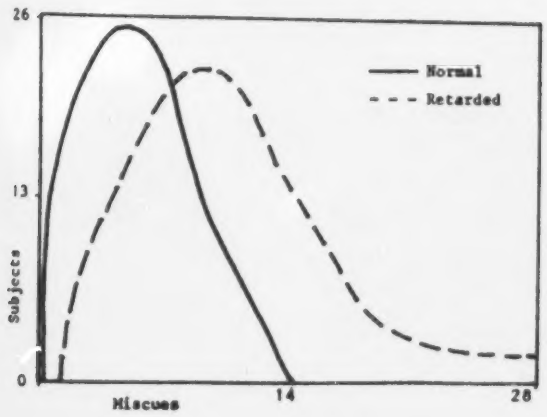

FIGURE 11
COMPARISON OF GROUP CURVES
GRAMMATICAL FUNCTION - NO

Group I is shown clustering around five miscues with a mean of 5.15, a standard deviation of 3.33, and a range of 14. Group II, on the other hand, had a range of 32, with a mean of 10.0, and a standard deviation of 8.41, indicating a tendency of the retarded to substitute more words which did not match the grammatical function of the anticipated response. This tendency is further substantiated in Table 14, in which approximately ninety-two percent of Group I fell between 0 and 10 miscues, while 92.3 percent of Group II was scattered from 0 to 20 miscues.

TABLE 14
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL FUNCTION - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	5-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	16	8	2									5.15	3.33
GROUP I CUM. %	61.5	92.3	100.0										
GROUP II READERS	11	8	3	2	1		1					10.08	8.41
GROUP II CUM. %	42.3	73.1	84.6	92.3	96.2		100.0						

*A significant difference was found between the groups at the .01 level.

Intra-group Comparison
Grammatical Function

On the basis of previous studies conducted to determine the ability of a reader to supply words of the appropriate grammatical class, it could be expected that there would be a significant difference between normal and retarded readers if matched on chronological age (Anastasiow & Stayrook, 1973). If, however, the students were matched on mental age, it is expected that mentally retarded subjects would perform with greater similarity to their mental-age peers. In the Anastasiow and Stayrook study, there was a differentiation in the ability of mentally retarded students to deal with concrete versus functional words. Retarded students were more able to supply concrete words in context than function words, illustrating their ability to deal more effectively with tasks requiring less abstraction.

With the analysis of data from the present study, it is not possible to determine the effect of word type on the miscues made. Additional research, beyond the scope of this study, is needed to analyze the word types of the substitutions to assess whether a significant difference exists between the groups' abilities to replace specific types of words more effectively.

Semmel, Barritt, and Bennett (1970) conducted a study to examine the reader's ability to supply words in a cloze task. They determined that sentence structure and word positions were significant factors affecting the ability of the groups to supply appropriate words. It is not a purpose of this study to analyze the sentence types and word positions in which words were substituted. An analysis of this type would determine whether performance by the present subjects would correlate with that of the 1970 subjects.

In the studies cited, the performance of the mentally retarded subjects consistently appeared to correlate more highly with the performance of mental-age peers rather than chronological-age mates. The mean mental age of the normal group in the present study was 9-5 and that of the mentally retarded group was 9-0. It could be expected that with the similarity in mental ages

of the groups, there would also be a similarity in their performance in matching words according to grammatical class. This similarity is demonstrated in Figure 12.

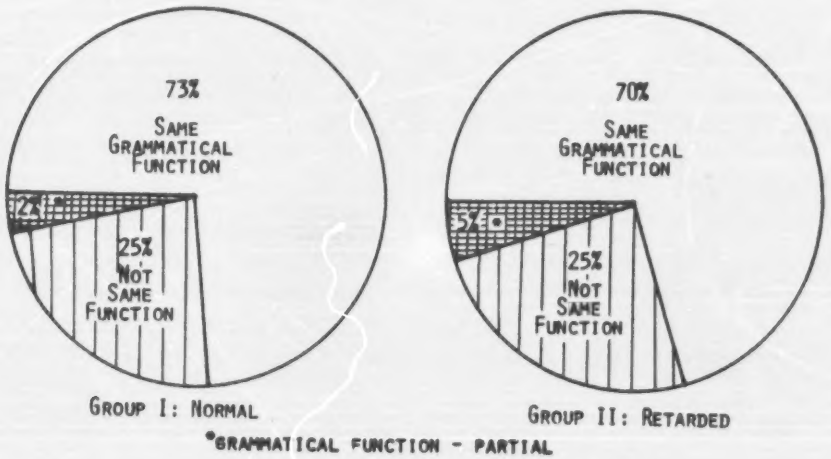

FIGURE 12
INTRA-GROUP PERCENTAGES
GRAMMATICAL FUNCTION

Seventy-three percent of the normal group's miscues and seventy percent of the miscues made by the retarded group were of the same grammatical function as the stimulus word. Twenty-five percent of the miscues of both groups were not of the same grammatical class and both groups had comparatively low percentages of words of undetermined grammatical function. It is evident that the normal readers and the mentally retarded readers of this study were able to substitute words of the same grammatical class to a similar degree.

Correction

QUESTION 4: Is there a significant difference in the frequency of miscue correction?

When a reader determines that he has produced a miscue, he has three options: (1) to correct the miscue orally by repeating a portion of the text, (2) to correct the miscue silently, or (3) to ignore the miscue and go on with the text. In the Goodman RMI, only those miscues that are corrected orally are classified as corrected. The amount of the text repeated in making the correction can be analyzed in an effort to determine the size of the language unit that the reader is responding to or the types of cues which caused the reader to recognize his miscue (Goodman, 1972). It is not the intent of this study to attempt such an analysis of the correction devices, but rather the purpose of this study is to tabulate the corrected miscues and compare them to the total number of miscues to assess the tendency of the groups to correct miscues. An analysis of correction strategies would be a relevant topic for further research. In the comparison of group means shown in Table 15, a significant difference was found only in the category containing uncorrected miscues. The means, standard

deviations, and ranges were similar in both the correction and partial correction subcategories.

TABLE 15
SUMMARY OF GROUP DATA
CORRECTION

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	12.31	11.08	6.60	8.54	4-27	0-31	.56*
No	24.92	45.27	11.15	29.05	1-49	13-124	**
Partial	1.31	1.12	1.76	1.40	0-6	0-5	.66*

*Difference not significant.
**Significant difference found beyond the .01 level.

Correction - Yes

In this category, a difference between the groups at the .56 level was not considered significant. Group I had a mean of 12.31 and a standard deviation of 6.6; Group II, a mean of 11.08 and a standard deviation of 8.54. The comparison of group curves presented in Figure 13 illustrates the similarity of group performance.

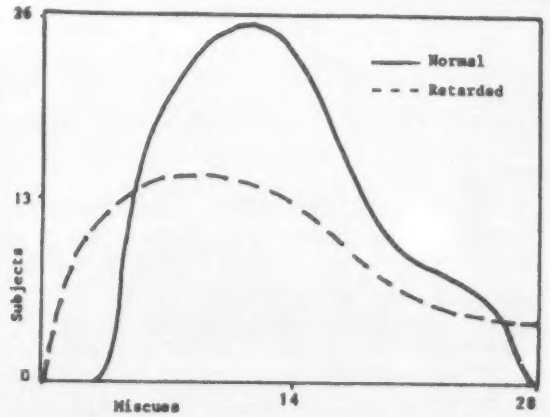

FIGURE 13
COMPARISON OF GROUP CURVES
CORRECTION - YES

Despite the slightly greater range of Group II, the similarity between the groups is apparent. This similarity is further substantiated in the summary of cumulative group percentages presented in Table 16.

TABLE 16
CUMULATIVE GROUP PERCENTAGES
CORRECTION - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	2	10	8	2	2	2						12.31	6.60
GROUP I CUM. %	7.7	46.2	76.9	84.6	92.3	100.0							
GROUP II READERS	7	9	4	2	1	2	1					11.08	8.54
GROUP II CUM. %	26.9	61.5	76.9	84.6	88.5	96.2	100.0						

*A difference between the groups at the .56 level was not considered significant.

Within a range of 23, eighty-four percent of Group I corrected from 4 to 17 miscues. In a similar manner, Group II ranged from 0 to 31 corrections with eighty-four percent of the group falling between 0 and 16 corrections. It is interesting to note that in the retarded group, there were subjects that corrected none of their miscues; while in the normal group, each subject corrected at least four of their miscues.

Correction - No

The difference beyond the .01 level which was found between the groups in the area of uncorrected miscues is illustrated in Figure 14.

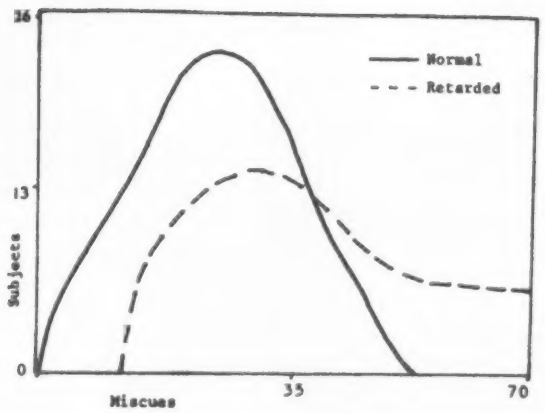

FIGURE 14
COMPARISON OF GROUP CURVES
CORRECTION - NO

Group I had a mean of 24.92 with a standard deviation of 11.15, while Group II had a mean of 45.27 with a standard deviation of 29.05. Group II's range of 111 was substantially greater than the 48-point range of Group I. The heterogeneity of Group II was apparent with sixty-one percent of the group falling between 11 and 40 uncorrected miscues, with the remaining thirty-nine percent ranging from 41 to 124 miscues. All readers of Group I, on the other hand, fell between 1 and 49 miscues.

TABLE 17
CUMULATIVE GROUP PERCENTAGES
CORRECTION - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	101-30		
GROUP I READERS	3	5	10	6	2							24.92	11.15
GROUP I CUM. %	11.5	30.8	69.2	92.3	100.0								
GROUP II READERS		5	5	6	1	3	1		1	1	2	45.27	29.05
GROUP II CUM. %		19.2	38.5	61.5	69.2	80.8	84.6		88.5	92.3	100.0		

*A significant difference was found between the groups beyond the .01 level.

Correction - Partial

When readers unsuccessfully attempted a correction, or when they abandoned a correct response for an incorrect one, the miscue was categorized as "Correction-Partial." In this classification, there was no significant difference found between the groups. The similarity of group curves is exemplified in Figure 15.

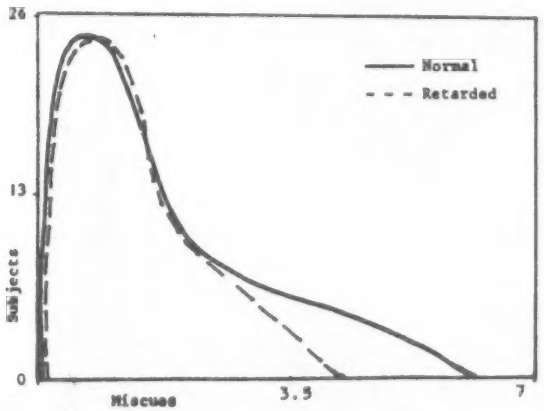

FIGURE 15
COMPARISON OF GROUP CURVES
CORRECTION - PARTIAL

This similarity of group performance is substantiated in the summary presented in Table 18. With a relatively small number of responses in this category, Group I had a mean of 1.31, a standard deviation of 1.76, and a range of 6. Similarly, Group II had a mean of 1.12, a standard deviation of 1.4, and a range of 5. It is interesting to note that the normal readers had a higher incidence of miscues in this category. It is possible that this is due to the greater tendency of normal readers to attempt to make corrections, while the retarded readers often tended to leave their miscues uncorrected as was revealed in the "Correction-No" subcategory analyzed above.

TABLE 18
CUMULATIVE GROUP PERCENTAGES
CORRECTION - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21		
Group I Readers	19	3	3	1								1.31	1.76
Group I Cum. %	73.1	84.6	96.2	100.0									
Group II Readers	19	6	1									1.12	1.4
Group II Cum. %	73.1	96.2	100.0										

*A difference between the groups at the .66 level was not considered significant.

Intra-group Comparison:
Correction

Although a comparison of group means did not reveal a significant difference between the groups in miscues corrected, the intra-group analysis shown in Figure 16

reveals a greater tendency for the retarded group to leave miscues uncorrected. Not correcting miscues could be the product of several factors. Goodman (1972) suggested (1) that readers often ignore miscues deliberately, preferring to continue reading or (2) that they correct the miscues silently. It is possible that Goodman's rationale regarding uncorrected miscues could explain the performance of the mentally retarded group of this study. It is also possible, however, that the retarded readers could be fulfilling Jordan's complaint (1969) that the mentally retarded often read with a disregard for "sense-destroying errors." Further analysis of the data would be necessary to determine which factor(s) are relevant. In addition, it is necessary to examine the Comprehension category of the Goodman RMI to determine whether the miscues affected comprehension of the text.

The intra-group comparison shown in Figure 16 reveals that both groups exhibited a greater percentage of uncorrected miscues. Despite a similar tendency to leave miscues uncorrected, it is evident that there was a difference between the groups in their correction strategies.

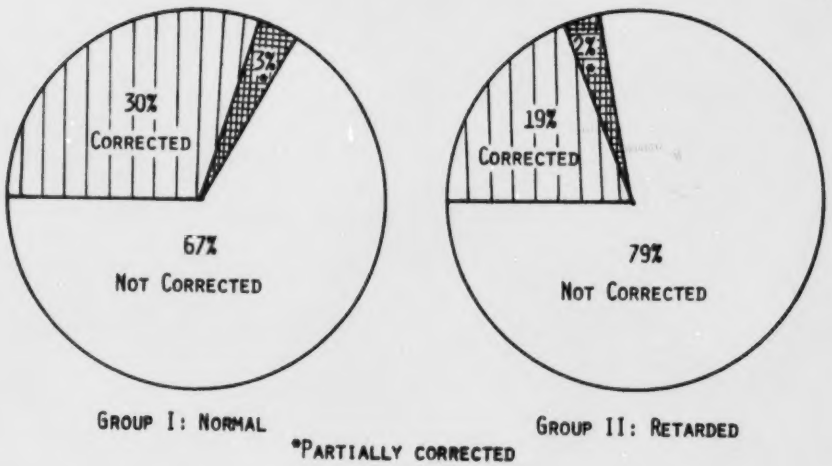

FIGURE 16
INTRA-GROUP PERCENTAGES
CORRECTION

While normal readers corrected thirty percent of their miscues, only nineteen percent of the retarded readers' miscues were corrected. The seventy-nine percent of the uncorrected miscues of the retarded readers was substantially greater than the sixty-seven percent of the uncorrected miscues of the normal readers. It appears, then, that differences did exist between the normal and mentally retarded groups of this study in the degree to which they corrected miscues.

Grammatical Acceptability

QUESTION 5: Is there a significant difference in the grammatical acceptability of the miscues produced?

The grammatical structure of a sentence provides cues to the reader which limit the types of words that are acceptable within the framework of a particular sentence. The Grammatical Acceptability category of the Goodman RMI attempts to assess the reader's use of these cues in identifying unknown words. In each of the subcategories of Grammatical Acceptability, there was a significant difference between the groups as shown in the summary of group data which is presented in Table 19.

TABLE 19
SUMMARY OF GROUP DATA
GRAMMATICAL ACCEPTABILITY

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	22.88	30.38	9.91	15.12	2-41	12-62	.04
Partial	11.54	16.15	4.91	10.59	5-23	4-43	.05
No	4.12	10.92	3.14	12.02	1-13	0-54	.01

Although Group II exhibited a greater range of abilities and more heterogeneity in all categories, the differences were most apparent in the "no" category, indicating a greater tendency for the retarded readers to make miscues that resulted in grammatically unacceptable structures.

Grammatical Acceptability - Yes

Miscues in this category reflected that a reader was dealing with the grammatical structure of the text

successfully. Based on an analysis of the group means, there was a significant difference at the .04 level between the groups in this area. The comparison of group curves presented in Figure 17 illustrates the difference in group ranges and distribution.

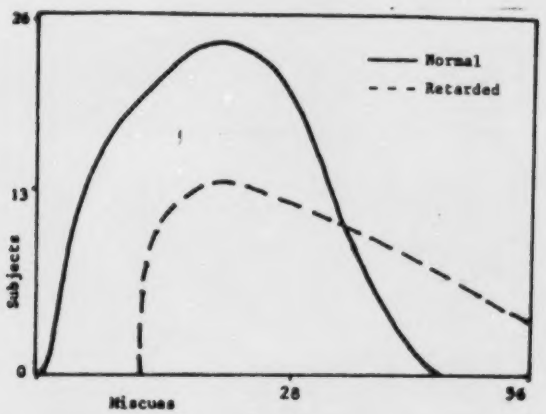

FIGURE 17
COMPARISON OF GROUP CURVES
GRAMMATICAL ACCEPTABILITY - YES

Group I, with a mean of 22.88 and a standard deviation of 9.91, ranged from 2 to 41 grammatically acceptable miscues. On the other hand, Group II had a mean score of 30.38, a standard deviation of 15.12, and a range of 50. Cumulative group percentages are presented in Table 20.

TABLE 20
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL ACCEPTABILITY - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-65		
Group I Readers	3		2	5	6	5	2	2	1			22.88	9.91
Group I Cum. %	11.5		19.2	38.5	61.5	80.8	88.5	96.2	100.0				
Group II Readers			4	6	3	2	1	4		2	4	30.38	15.12
Group II Cum. %			15.4	38.5	50.0	57.7	61.5	76.9		84.6	100.0		

*A significant difference was found between the groups at the .04 level.

Sixty-one percent of Group I fell between 0 and 25 miscues with the remaining thirty-nine percent ranging between 26 and 41 miscues. Group II, however, had fifty percent of the group making between 11 and 25 grammatically acceptable miscues with the remaining fifty percent ranging to a total of 62, suggesting that the mentally retarded readers were more heterogeneous in their ability to supply grammatically acceptable words to the text.

Grammatical Acceptability - Partial

If a miscue was grammatically acceptable when viewed in only a portion of the context, it was classified as partially grammatically acceptable. Group II again proved to be more heterogeneous than Group I as is portrayed in Figure 18.

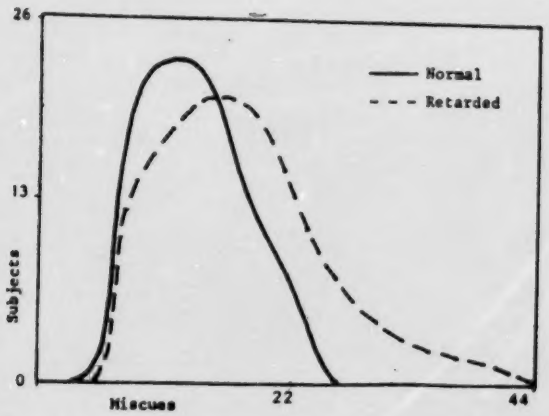

FIGURE 18
COMPARISON OF GROUP CURVES
GRAMMATICAL ACCEPTABILITY - PARTIAL

While Group II ranged from 4 to 43 miscues with a mean of 16.15 and a standard deviation of 10.59, Group I readers ranged from 5 to 23 miscues with a mean of 11.54 and a standard deviation of 4.91. The distribution of group percentages presented in Table 21 shows 88.5 percent of Group I within an eleven-point range from 5 to 16 miscues, while 80.8 percent of Group II ranged from 4 to 25 miscues.

TABLE 21
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL ACCEPTABILITY - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	1	11	10	1	3							11.54	4.91
GROUP I CUM. %	3.8	46.2	84.6	88.5	100.0								
GROUP II READERS	1	11	4	2	3	1	2	1	1			16.15	10.59
GROUP II CUM. %	3.8	46.2	61.5	69.2	80.8	84.6	92.3	96.2	100.0				

*A significant difference was found between the groups at the .05 level.

Although the groups were comparable at lower frequencies of miscues, the retarded group exhibited a greater variability in the higher miscue range. This finding substantiates the diversity between the groups shown in Figure 18.

Grammatical Acceptability - No

Miscues made by readers that were not grammatically acceptable in the context of the selection were placed in this category. Group I had a mean score of 4.12 and a standard deviation of 3.14. Group II, on the other hand, had a mean score of 10.92 and a standard deviation of 12.02. The significant difference found between the groups at the .01 level is apparent in the comparison between the group curves presented in Figure 19.

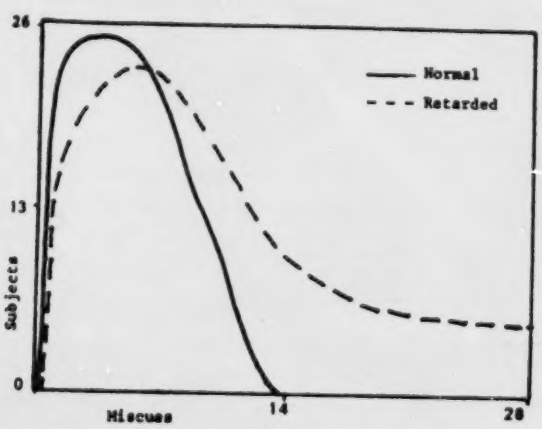

FIGURE 19
COMPARISON OF GROUP CURVES
GRAMMATICAL ACCEPTABILITY - NO

More heterogeneous than Group I, the retarded readers of Group II had a range from 0 to 54 miscues compared to the Group I range from 1 to 13 miscues. The comparison of group percentages presented in Table 22 shows eighty percent of Group I clustered between 1 and 5 miscues, while only 46.2 percent of the Group II readers fell within this range, with the rest scattered between 6 and 54 grammatically unacceptable miscues. This finding substantiates the diversity of the retarded readers and the tendency for the retarded readers to make a greater number of unacceptable responses.

TABLE 22
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL ACCEPTABILITY - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
Group I Readers	21	4	1									4.12	3.14
Group I Cum. %	80.8	96.2	100.0										
Group II Readers	10	3	7		2		1				1	10.92	12.02
Group II Cum. %	46.2	57.7	84.6		92.3		96.2				100.0		

*A significant difference was found between the groups at the .01 level.

Intra-group Comparison: Grammatical Acceptability

Previous studies involving the language patterns of normal and retarded children have revealed that differences do exist between the groups in their ability to utilize grammar. Retarded students, although able to

deal with more concrete aspects of language, were not as adept at producing the complex language patterns of normal children. Hargis (1972) found that retarded children were not as able to supply grammatically-correct words in a cloze task. It appears that performance in the Hargis study, as well as in similar studies (Levitt, 1970; Semmel, et al.) was affected by factors such as strength or ambiguity of the context, word position in the sentence, and sentence structure. It was evident in all studies that although mentally retarded students did utilize grammatic cues in their reading, they were not as capable as normal readers in this area. The results of the present study appear to substantiate previous findings as revealed in Figure 20. Both groups utilized grammatical cues in their reading; however, the normal readers made more grammatically acceptable miscues, thus indicating their success in coping with the grammatic structure of the selections.

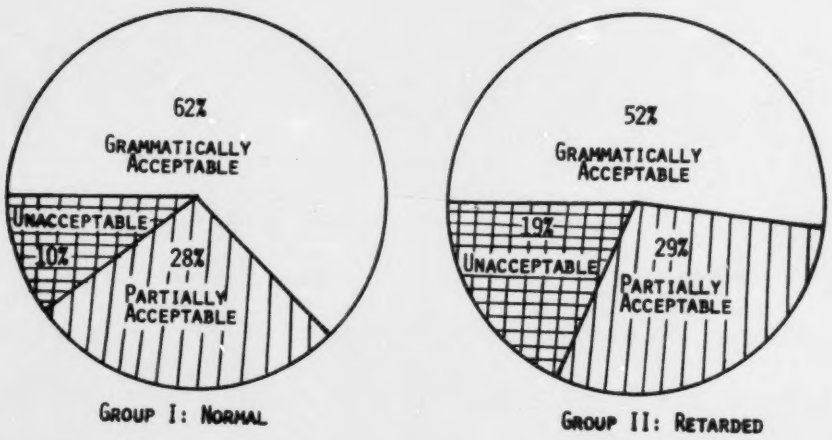

FIGURE 20
INTRA-GROUP PERCENTAGES
GRAMMATICAL ACCEPTABILITY

Sixty-two percent of the normal readers' miscues were totally grammatically acceptable within the selection, while only fifty-two percent of the retarded readers' miscues could be so classified. The retarded group also had a greater percentage of miscues that were completely unacceptable within the text. The normal group had only ten percent of their miscues in this category, while the retarded readers had nearly double this percentage of unacceptable miscues. It is evident, then, that a difference existed between the normal and mentally retarded readers in their ability to produce grammatically acceptable miscues within the context of a selection.

Semantic Acceptability

QUESTION 6: Is there a significant difference in the semantic acceptability of the miscues produced?

Semantic acceptability refers to the ability of the reader to produce understandable sentence structures when reading. The extent to which a meaningful structure is produced is of primary importance in this category. The results of the comparison of aggregate group means presented in Table 23 shows a significant difference in the "Partial" and "No" subcategories, while the difference between the means in the "Yes" subcategory was not considered significant.

TABLE 23
SUMMARY OF GROUP DATA
SEMANTIC ACCEPTABILITY

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	18.31	20.92	6.25	10.64	6-32	10-48	.29*
Partial	12.77	19.42	7.08	10.19	0-27	8-42	.01
No	7.46	17.12	4.81	18.10	2-20	2-78	.01

*Difference not significant.

Semantic Acceptability - Yes

In this category, the difference between the group means at the .29 level was not considered significant. With a mean of 18.31 and a standard deviation of

6.25, Group I ranged from 6 to 32 semantically-acceptable miscues. Group II performed similarly with a mean of 20.92, a standard deviation of 10.64, and a range of 38. The similarity of group distribution is illustrated in Figure 21.

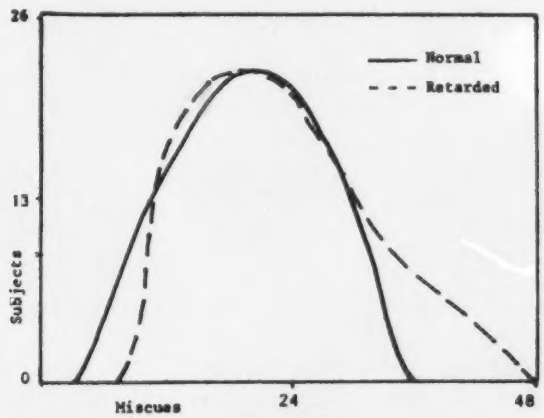

FIGURE 21
COMPARISON OF GROUP CURVES
SEMANTIC ACCEPTABILITY - YES

This similarity is further substantiated in Table 24 in which ninety-six percent of Group I made between 6 and 30 semantically-acceptable miscues and ninety-six percent of Group II made between 6 and 40 miscues in this category.

TABLE 24
CUMULATIVE GROUP PERCENTAGES
SEMANTIC ACCEPTABILITY - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	50-55		
GROUP I READERS		2	7	9	5	2	1					18.31	6.25
GROUP I CUM. %		7.7	34.6	69.2	88.5	96.2	100.0						
GROUP II READERS		3	10	3	2	2	3	2		1		20.92	10.64
GROUP II CUM. %		11.5	50.0	61.5	69.2	76.9	88.5	96.2		100.0			

*The difference found between the groups at the .29 level was not considered significant.

Semantic Acceptability - Partial

Partial semantic acceptability indicated that miscues were semantically acceptable when considered in only a portion of the entire context. In this category, based on a comparison of group means, Groups I and II differed significantly at the .01 level. Group I, with a mean of 12.77 and a standard deviation of 7.08 ranged from 0 to 27 miscues that were partially acceptable. Group II performed more heterogeneously with a range of 34, a mean of 19.42, and a standard deviation of 10.19. The Group II curve, shown in Figure 22, is skewed to the left indicating a concentration of subjects at a lower frequency of miscues.

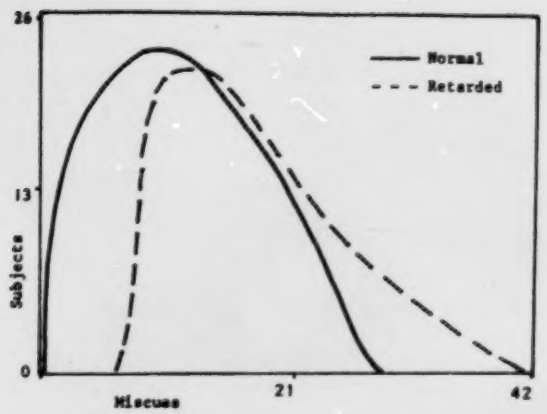

FIGURE 22
COMPARISON OF GROUP CURVES
SEMANTIC ACCEPTABILITY - PARTIAL

The concentration of the groups at lower frequencies is further substantiated in Table 25, as eighty-four percent of Group I ranged from 0 to 19 miscues while 80.8 percent of Group II fell between 8 and 29 miscues. The remaining twenty percent of the retarded readers ranged to 42 miscues, while Group I exhibited less variability.

TABLE 25
CUMULATIVE GROUP PERCENTAGES
SEMANTIC ACCEPTABILITY - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											* MEAN	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
Group I READERS	3	6	10	3	2	2						12.77	7.08
Group I CUM. %	11.5	34.6	73.1	84.6	92.3	100.0							
Group II READERS		3	9	5	3	1	2	2	1			19.42	10.19
Group II CUM. %		11.5	46.2	65.4	76.9	80.8	88.5	96.2	100.0				

* A significant difference was found between the groups at the .01 level.

Semantic Acceptability - No

Miscues that were not semantically acceptable in the context of the selection were placed in this category. There was a significant difference found between the means of the two groups at the .01 level. Group I, with a mean of 7.46 and a standard deviation of 4.81 differed significantly from Group II's mean of 17.12 and standard deviation of 18.1. Both groups clustered at the lower frequencies of miscues as is shown in Figure 23.

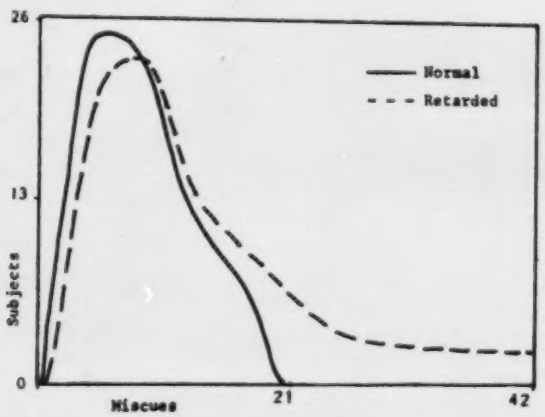

FIGURE 23
COMPARISON OF GROUP CURVES
SEMANTIC ACCEPTABILITY - NO

Despite the clustering of subjects at the lower frequency range, Group II was more heterogeneous as is summarized in Table 26. Approximately ninety-six percent of Group I fell between 0 and 19 semantically unacceptable miscues, while only sixty-nine percent of Group II fell within

this range. The remaining thirty-one percent of Group II were scattered from 20 to 78 miscues exemplifying the greater number of miscues made by the retarded group and the greater diversity within this group.

TABLE 26
CUMULATIVE GROUP PERCENTAGES
SEMANTIC ACCEPTABILITY - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-09		
GROUP I READERS	20	5	1									7.46	4.81
GROUP I CUM. %	76.9	96.2	100.0										
GROUP II READERS	12	6	4	1	1	1		1				17.12	18.10
GROUP II CUM. %	57.7	69.2	84.6	88.5	92.3	96.2		100.0					

*A significant difference was found between the groups at the .01 level.

Intra-group Comparison: Semantic Acceptability

The ability of readers to deal with semantic cues in reading has been discussed in studies comparing normal and mentally retarded subjects. Miller and Yoder (1975) indicated that retarded children acquire semantic abilities in much the same manner as normal children, only at a slower rate. This was substantiated by Anastasiow and Stayrook (1973) who found mentally retarded subjects to develop significantly slower than normal subjects in their ability to deal with abstract semantic concepts.

In assessing the ability of mentally retarded readers to utilize the context of a passage to enhance

word recognition, Ramanauskas (1972) found that the retarded readers appeared to use contextual cues beyond the sentence level. It was the opinion of that author, however, that this skill was not as well developed as it was for normal readers, thus representing an area of weakness for the retarded.

The findings of the present study concurred with those of previous studies. The intra-group comparison presented in Figure 24 exemplifies a difference between the groups in their utilization of semantic cues in reading.

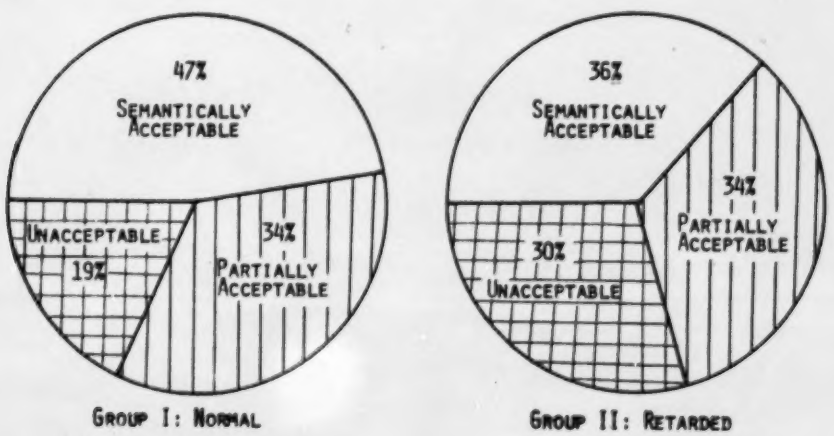

FIGURE 24
INTRA-GROUP PERCENTAGES
SEMANTIC ACCEPTABILITY

Forty-seven percent of the miscues made by the normal readers were semantically acceptable within the

entire context of the selection, with an additional thirty-four percent acceptable in a portion of the text. Mentally retarded readers, on the other hand, had only thirty-six percent semantically-acceptable miscues with thirty-four percent partially acceptable. Thirty percent of the miscues made by retarded readers were completely unacceptable, while only nineteen percent of the normal readers' miscues were placed in this category.

Although the differences between the groups were not extreme, it is nevertheless evident that capabilities in using semantic cues in reading did differ between mentally retarded and normal readers.

Meaning Change

QUESTION 7: Is there a significant difference in the degree of meaning change caused by the miscues?

Because comprehension is the ultimate goal of reading instruction, the degree of meaning change caused by a miscue is of primary concern. It is vital that comprehension be developed in mentally retarded readers since, as Jordan (1969) indicated, "reading can be functional only to the extent that it is meaningful (p. 132)."

The summary of group data presented in Table 27 reveals a significant difference between the groups in the "Yes" and "Partial" subcategories, which indicate some degree of meaning change. Based on a comparison of group means, no significant difference was found between the groups in the subcategory containing miscues which caused no meaning change.

TABLE 27
SUMMARY OF GROUP DATA
MEANING CHANGE

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Yes	16.38	26.38	9.30	23.75	6-45	6-100	.05
Partial	8.42	14.58	2.45	8.55	3-13	4-38	**
No	15.96	16.50	6.24	7.28	2-28	7-32	.78*

*Difference not significant.
**Significant difference found beyond the .01 level.

Meaning Change - Yes

A significant difference at the .05 level was found between the groups in this category containing miscues that completely changed the meaning of the reading selection. Group I had a mean score of 16.38, a standard deviation of 9.3, and a range of 39; while Group II had a comparatively greater number of meaning changing miscues with a mean of 26.38, a standard deviation of 23.75, and a range of 94.

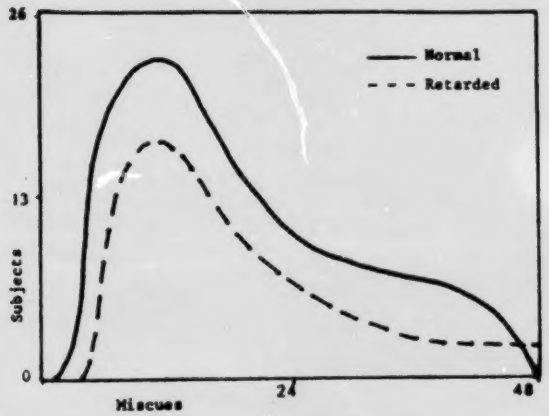

FIGURE 25
COMPARISON OF GROUP CURVES
MEANING CHANGE - YES

The comparison of group curves presented in Figure 25 shows Group I subjects clustered at lower frequency levels. Group II exhibited a similar pattern of cluster at the lower end of the curve; however, sixteen percent of the retarded readers made more than forty meaning changing miscues. The heterogeneity of Group II is further illustrated in the summary of cumulative percentages given in Table 28.

TABLE 28
CUMULATIVE GROUP PERCENTAGES
MEANING CHANGE - YES

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-09		
Group I Readers	8	11	4	2	1							16.38	9.3
Group I Cum. %	30.8	73.1	88.5	96.2	100.0								
Group II Readers	6	9	2		2	2		1			1	26.38	23.75
Group II Cum. %	23.1	57.7	69.2		84.6	92.3		96.2			100.0		

*A significant difference was found between the groups at the .05 level.

It is evident that although there were similarities between the groups at the lower frequency levels, the retarded readers were more diverse and showed a greater tendency to make meaning-changing miscues.

Meaning Change - Partial

In this category containing miscues that caused a partial change in meaning, there was a significant difference between the two groups of readers beyond the .01 level. Group I had a mean score of 8.42, a standard deviation of 2.45, and a range of 10; while Group II had a mean score of 14.58, a standard deviation of 8.55, and a range of 34. The comparison of group curves presented in Figure 26 depicts the broader range of Group II.

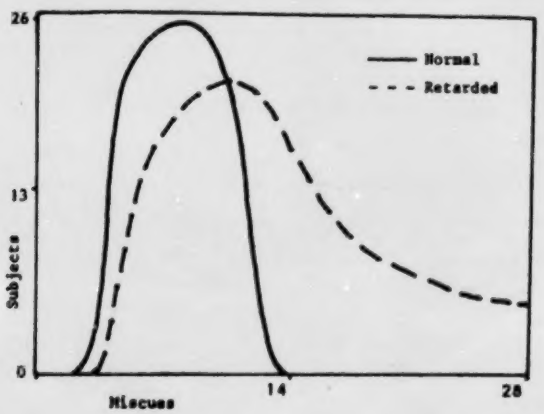

FIGURE 26
COMPARISON OF GROUP CURVES
MEANING CHANGE - PARTIAL

While the normal readers of Group I clustered around the mean with little variability in their performance, the retarded readers were more heterogeneous and showed a greater tendency to make miscues which partially changed the meaning of the selection.

The distribution of groups is summarized in the cumulative percentages shown in Table 29. Eighty percent of the Group I readers fell between 3 and 10 miscues. Only 38.5 percent of the retarded readers fell within this range, with the remaining Group II readers distributed between 11 and 38. This further substantiates the heterogeneity depicted in Figure 26.

TABLE 29
CUMULATIVE GROUP PERCENTAGES
MEANING CHANGE - PARTIAL

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
Group I Readers	4	17	5									8.42	2.45
Group I Cum. %	15.4	80.8	100.0										
Group II Readers	3	7	5	6	1	3		1				14.58	8.55
Group II Cum. %	11.5	38.5	57.7	80.8	84.6	96.2		100.0					

*A significant difference was found between the groups beyond the .01 level.

Meaning Change - No

In terms of reading success, this is the most positive subcategory of the meaning change classification, indicating that no change in meaning was generated by the miscue in question. A difference between the group means

at the .78 level was not considered significant. Group I, with a mean score of 15.96 and a standard deviation of 6.24, was similar to Group II's mean score of 16.50 and standard deviation of 7.28. The similarity in the distribution of both groups is revealed in Figure 27.

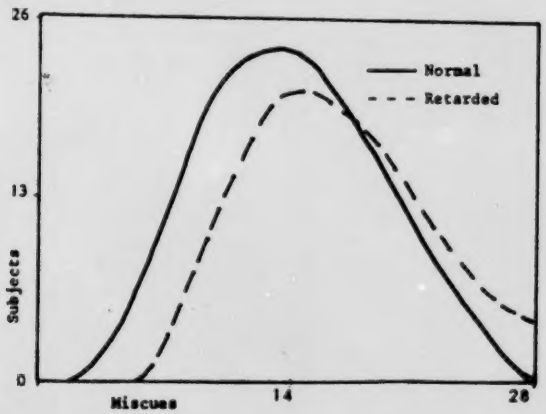

FIGURE 27
COMPARISON OF GROUP CURVES
MEANING CHANGE - NO

This similarity is further demonstrated in Table 30 in which a summary of the cumulative group percentages is presented. It is evident that both groups were clustered within a relatively small range with all readers making between 0 and 35 miscues that resulted in no change of meaning.

TABLE 30
CUMULATIVE GROUP PERCENTAGES
MEANING CHANGE - NO

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
GROUP I READERS	1	2	11	6	4	2						15.96	6.24
GROUP I CUM. %	3.8	11.5	53.8	76.9	92.3	100.0							
GROUP II READERS		8	7	3	5	2	1					16.50	7.28
GROUP II CUM. %		30.8	57.7	69.2	88.5	96.2	100.0						

*A difference between the groups at the .78 level was not considered significant.

Intra-group Comparison:
Meaning Change

As is illustrated in Figure 28, in spite of the similarities between group means cited above, there appeared to be a difference between the groups when the subcategory totals of Meaning Change were compared with the total number of miscues for each group.

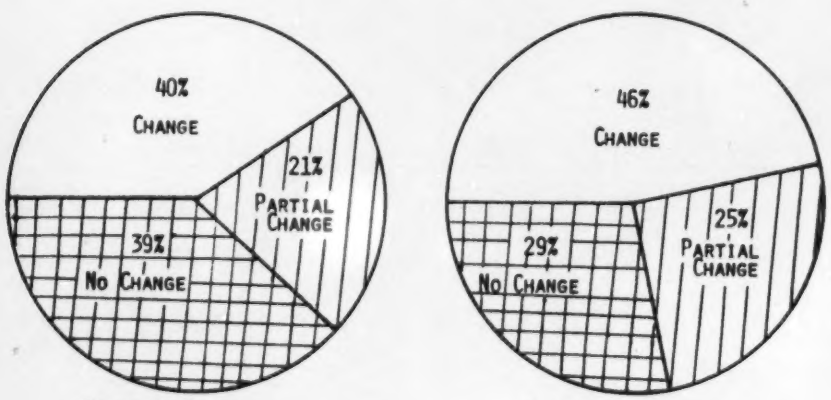

FIGURE 28
INTRA-GROUP PERCENTAGES
MEANING CHANGE

Seventy-one percent of the miscues made by the retarded readers involved extensive or partial meaning change, while only sixty-one percent of the normal readers' miscues changed the meaning of the text in any way. A similar differentiation was seen between the groups as twenty-nine percent of the mentally retarded readers' miscues and thirty-nine percent of the normal readers' miscues did not cause any meaning change. Although it is evident that retarded readers exhibited a greater tendency to make miscues which interfered to some degree with the meaning of the text, it should be noted that the majority of their miscues did not completely change the meaning. This indicates a positive ability of the retarded to read for meaning. This potential must be taken into consideration when selecting teaching methodology, materials, and curriculum for the retarded. As Dever (1969) has stated, "It cannot be overemphasized that retarded children must be taught what to do, not what they cannot do (p. 368)." This concurs with Bateman (1965) and Jordan (1969) who imply that direct teaching is necessary to develop in the retarded the concept that reading is a search for meaning. With the knowledge that mentally retarded readers often make meaning-changing miscues, it is necessary to emphasize the ultimate purpose of reading by the selection

of appropriate methods and materials that will enhance meaning.

Comprehension

QUESTION 8: Is there a significant difference in patterns of comprehension in terms of no loss, partial loss, and loss?

This category represents a comparison among correction, semantic acceptability, and meaning change. The results of this comparison provided an insight into the effectiveness of reading strategies in promoting meaning for the reader. In the summary of data presented in Table 31, the differences between the groups is apparent in the "Loss" and "Partial Loss" subcategories. In these areas, the retarded readers appeared to have a greater range of miscues with significantly higher means. No significant difference, however, was found in the "No Loss" subcategory.

TABLE 31
SUMMARY OF GROUP DATA
COMPREHENSION

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
No Loss	25.50	24.85	8.18	11.43	9-43	10-55	.81*
Partial Loss	6.69	13.62	2.46	9.24	3-12	3-40	**
Loss	8.58	19.00	6.51	21.97	1-25	2-99	.02

*Difference not significant.
**Significant difference found beyond the .01 level.

Comprehension - No Loss

A difference between group means at the .81 level was not considered significant in this category. Group I had a mean score of 25.5 with a standard deviation of 8.18 and a range of 34; and Group II performed similarly with a mean score of 24.85, a standard deviation of 11.43, and a range of 45. The similarity between the groups is apparent in Figure 29.

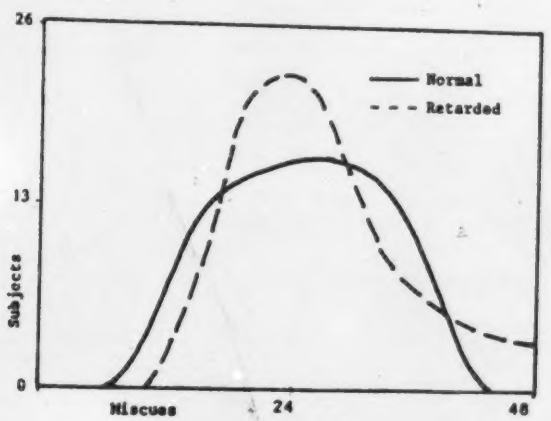

FIGURE 29
COMPARISON OF GROUP CURVES
COMPREHENSION - NO LOSS

The similarity between the groups is also illustrated in Table 32. In the summary of cumulative group percentages, ninety-six percent of Group I fell between 2 and 39 miscues, while ninety-six percent of Group II ranged from 10 to 49 miscues.

TABLE 32
CUMULATIVE GROUP PERCENTAGES
COMPREHENSION - NO LOSS

READERS / CUM. %	NUMBER OF MISCUES											* MEAN	S.D.
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-09		
GROUP I READERS	1	6	9	9	1							25.5	8.18
GROUP I CUM. %	3.8	26.9	61.5	96.2	100.0								
GROUP II READERS		11	9	3	2	1						24.85	11.43
GROUP II CUM. %		42.3	76.9	88.5	96.2	100.0							

*A difference between the groups at the .81 level was not considered significant.

Comprehension - Partial Loss

In this category, there was a significant difference beyond the .01 level between the groups. The comparison of group curves shown in Figure 30 illustrates this difference. It is evident that the normal readers showed considerably less variability in performance with a smaller range of miscues.

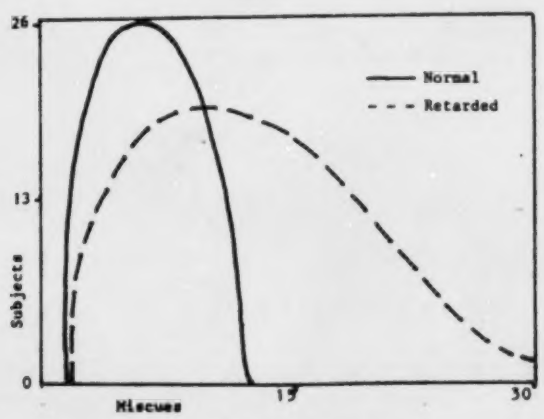

FIGURE 30
COMPARISON OF GROUP CURVES
COMPREHENSION - PARTIAL LOSS

The normal readers had a mean score of 6.69 and a standard deviation of 2.46 in contrast to the mentally retarded readers' mean score of 13.62 and standard deviation of 9.24. The intra-group diversity of the retarded readers is further substantiated in Table 33, with Group I clustering between 3 and 12 miscues, while Group II was scattered from 3 to 40 miscues. Only forty-six percent of the retarded readers fell in the 0 to 10 miscue range, while ninety-two percent of Group I was encompassed in this range.

TABLE 33
CUMULATIVE GROUP PERCENTAGES
COMPREHENSION - PARTIAL LOSS

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55		
Group I Readers	7	17	2									6.69	2.46
Group I Cum. %	26.9	92.3	100.0										
Group II Readers	6	6	4	6	1	2		1				13.62	9.24
Group II Cum. %	23.1	46.2	61.5	84.6	88.5	96.2		100.0					

* A significant difference was found between the groups beyond the .01 level.

Comprehension - Loss

Miscues that caused complete loss of comprehension of the text were placed in this category. A significant difference at the .02 level was found between the groups, with the diversity illustrated in Figure 31. Group I, with a mean score of 8.58 and a standard deviation of 6.51, had a range of 24. Group II was distributed quite differently with a mean score of 19.0, a standard deviation of 21.97, and a range of 97. The extreme difference

in range was apparent as the normal readers were clustered at the lower frequency range, while the retarded readers were more diverse in their distribution.

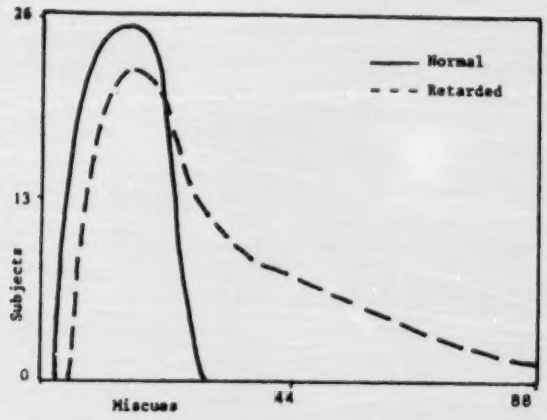

FIGURE 31
COMPARISON OF GROUP CURVES
COMPREHENSION - LOSS

A summary of cumulative percentages in this category is provided in Table 34. This summary further exemplifies the differences in group distribution. While eighty-four percent of Group I fell between 1 and 19 miscues, only sixty-five percent of Group II fell in this range, with the remaining thirty-five percent scattered from 20 to 99 miscues.

TABLE 34
CUMULATIVE GROUP PERCENTAGES
COMPREHENSION - LOSS

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	100-09		
GROUP I READERS	19	3	4									8.58	6.51
GROUP I CUM. %	73.1	84.6	100.0										
GROUP II READERS	13	4	4	3			1			1		19.0	21.97
GROUP II CUM. %	50.0	65.4	80.8	92.3			96.2			100.0			

*A significant difference was found between the groups at the .02 level.

Intra-group Comparison:
Comprehension

According to Goodman guidelines (1972, pp. 113-114), a reader's use of reading strategies can be determined through an examination of comprehension patterns: (a) A reader who makes efficient use of reading strategies shows no less than 60% "No Loss" of comprehension and no more than 40% "Loss" of comprehension; (b) A reader who has moderately effective reading strategies shows no less than 40% "No Loss" and no more than 40% "Loss" of comprehension; (c) The reader who is just beginning to show some use of reading strategies has no less than 15% "No Loss" and no more than 70% "Loss" of comprehension; and (d) A reader who has ineffective reading strategies shows no more than 14% "No Loss" and no less than 86% "Loss" of comprehension.

As revealed in Figure 32, the normal readers of this study represented readers who made efficient use of reading strategies. Sixty-three percent of their miscues represented "No Loss" of comprehension, while 21% involved a "Loss" of meaning. Group II readers, on the other hand, represented readers with only moderately effective reading strategies. Only 43% of their miscues were "No Loss" while 34% represented "Loss" of meaning.

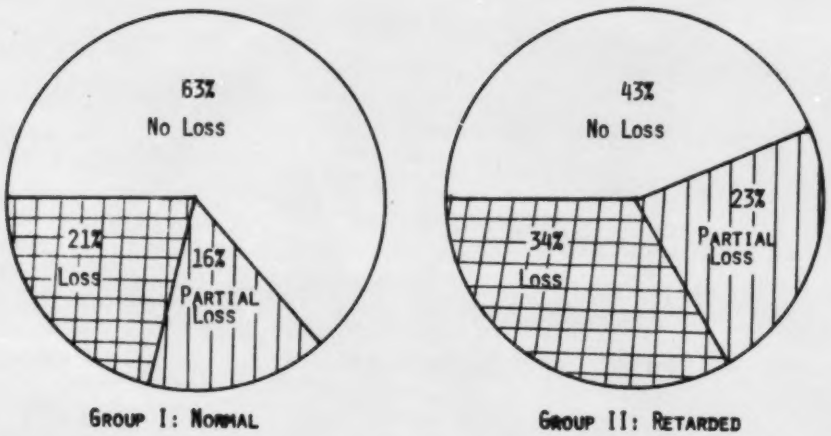

FIGURE 32
INTRA-GROUP PERCENTAGES
COMPREHENSION

The findings of the present study concurred with the results of previous studies in the area of reading comprehension. Bliesmer (1954) compared groups of mentally retarded and normal readers on several criterion measures of reading. The groups differed significantly at the .05 level in total reading comprehension abilities, with normal readers exhibiting a greater competence in comprehension tasks than retarded readers.

Ramanauskas (1972) suggested that mentally retarded children are characterized as "word callers who read by memorizing individual words (p. 338)." In her study, she found that, to the contrary, retarded subjects did respond to grammatic/semantic cues beyond the sentence level. This further substantiated the possibility that

mentally retarded readers would be able to utilize reading strategies with some degree of effectiveness.

Although differences in the present study were apparent between the groups in their effectiveness in utilizing reading strategies, the differences were not extreme. It seems plausible, on the basis of this and other research with the mentally retarded, that retarded readers are able to use reading strategies and that with direct instruction they could be taught to use these strategies more effectively.

Grammatical Relationships

QUESTION 9: Is there a significant difference in patterns of grammatical relationships which result in reading strengths, partial strengths, weaknesses, or overcorrection.

In determining the grammatical relationship patterns of the reader, the Goodman Reading Miscue Inventory compares correction strategies with grammatic and semantic acceptability factors. In essence, an analysis of grammatical relationships provides "insight into how concerned the reader is that his oral reading sounds like language (Goodman, 1972, p. 71)."

The summary of group data presented in Table 35 reveals significant differences between the groups in two of the four subcategories. When aggregate group means were compared, no significant difference was found in the "Strength" and "Overcorrection" areas; while significant differences beyond the .01 level were found between the groups in the "Partial Strength" and "Weakness" subcategories.

TABLE 35
SUMMARY OF GROUP DATA
GRAMMATICAL RELATIONSHIPS

GOODMAN RMI CATEGORIES	GROUP MEANS		STANDARD DEVIATIONS		RANGE OF SCORES		SIGNIF. LEVELS
	I	II	I	II	I	II	
Strength	24.88	24.77	6.22	12.35	15-36	10-52	.97*
Part. Strength	4.50	8.54	2.76	6.30	0-9	0-20	**
Weakness	7.54	20.88	5.29	20.32	0-22	3-93	**
Overcorrection	3.85	3.27	2.57	3.05	0-10	0-14	.47*

*Difference not significant.
**Significant difference found beyond the .01 level.

Grammatical Relationships - Strength

Miscues placed in this category were indicative of an efficient use of both meaning and grammatical cues, and an appropriate use of correction strategies. The analysis of group means indicated a difference between the normal and retarded readers at the .97 level, which was not considered significant. Group I, with a mean of 24.88 and a standard deviation of 6.22, ranged from 15 to

36 miscues; while Group II had a forty-two point range from 10 to 52 with a mean score of 24.77 and a standard deviation of 12.35. This similarity of performance is depicted in Figure 33.

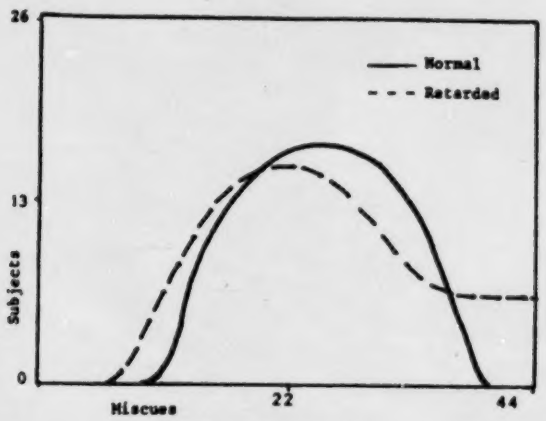

FIGURE 33
COMPARISON OF GROUP CURVES
GRAMMATICAL RELATIONSHIPS - STRENGTH

It is evident that the distribution of the groups was similar, although the retarded readers displayed a somewhat greater heterogeneity than the normal readers. The cumulative group percentages presented in Table 36 further substantiate these findings. The distribution of groups appeared similar; however, three retarded subjects fell above the range of Group I.

TABLE 36
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL RELATIONSHIPS - STRENGTH

READERS / CUM. %	NUMBER OF MISCUES											MEAN *	S.D.
	0-5	6-10	11-15	16-20	21-15	26-30	31-35	36-40	41-45	46-50	51-55		
Group I Readers			1	7	5	8	4	1				24.88	6.22
Group I Cum. %			3.8	30.8	50.0	80.8	96.2	100.0					
Group II Readers		2	5	7	1	5	1	1		2	1	24.77	12.35
Group II Cum. %		7.7	26.9	53.8	57.7	76.9	80.8	84.6		96.2	100.0		

* A difference between the groups at the .96 level was not considered significant.

Grammatical Relationships - Partial Strength

This grammatical relationship pattern represented the reader's efficient use of grammatical cues to the exclusion of meaning. Based on a comparison of group means, there was a significant difference between the groups at the .01 level. This difference is illustrated in Figure 34. With a mean score of 4.5 and a standard deviation of 2.76, Group I had a relatively small range of 9; while Group II had a mean score of 8.54, a standard deviation of 6.3, and a range of 20.

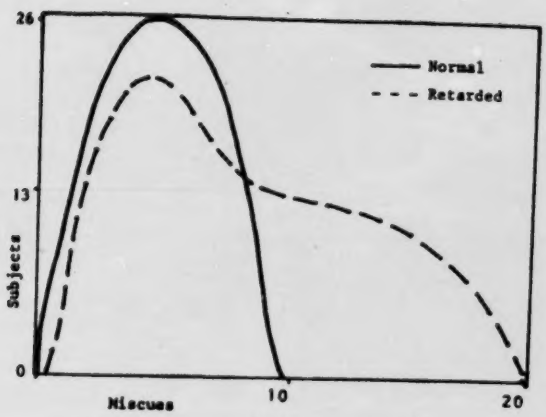

FIGURE 34
COMPARISON OF GROUP CURVES
GRAMMATICAL RELATIONSHIPS - PARTIAL STRENGTH

The summary of cumulative group percentages presented in Table 37 supports the differences between the groups. While sixty-nine percent of Group I clustered between 0 and 5 miscues, only forty-two percent of Group II fell in this range with the remaining fifty-eight percent of the group making as many as twenty miscues in this category.

TABLE 37
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL RELATIONSHIPS - PARTIAL STRENGTH

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-5	6-10	11-15	16-20									
GROUP I READERS	18	6										4.5	2.76
GROUP I CUM. %	69.2	100.0											
GROUP II READERS	11	6	4	5								8.54	6.3
GROUP II CUM. %	42.3	65.4	80.8	100.0									

*A significant difference between the groups was found at the .01 level.

Grammatical Relationships - Weakness

A significant difference beyond the .01 level was found between the groups in this classification depicting a pattern of failure of the reader to use grammar, meaning cues, or correction strategies. The comparison of the group curves presented in Figure 35 substantiates this difference.

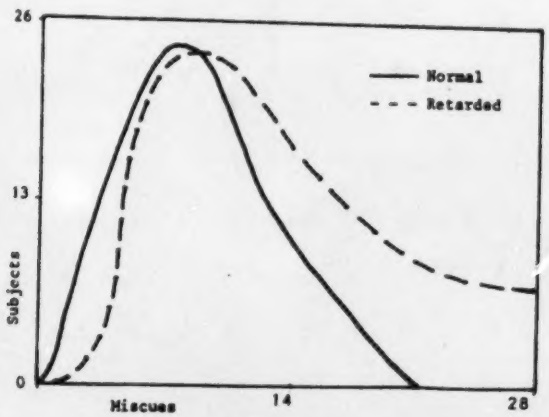

FIGURE 35
COMPARISON OF GROUP CURVES
GRAMMATICAL RELATIONSHIPS - WEAKNESS

Coupled with the cumulative group percentages given in Table 38, it is evident that the normal readers clustered at the lower frequencies of miscues while the retarded readers were more diverse in their performance, having substantially more miscues in this category.

TABLE 38
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL RELATIONSHIPS - WEAKNESS

READERS / CUM. %	NUMBER OF MISCUES											MEAN *	S.D.
	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99			
GROUP I READERS	20	5	1									7.54	5.29
GROUP I CUM. %	76.9	96.2	100.0										
GROUP II READERS	8	10	3	2		1	1			1		20.88	20.32
GROUP II CUM. %	30.8	69.2	80.8	88.5		92.3	96.2			100.0			

*A significant difference between the groups beyond the .01 level.

With a mean of 7.54 and a standard deviation of 5.29, Group I clustered closely around the mean. The twenty-two point range of Group I was relatively small compared to Group II's range of 90. The 20.88 mean and 20.32 standard deviation of Group II and the broad range of abilities exemplified the heterogeneity that is typical of a group of mentally retarded students.

Grammatical Relationships - Overcorrection

Miscues which were corrected when it was inefficient or unnecessary to do so fell into this category. A small number of miscues were so classified, with no statistical significance found between the groups. Group I's mean and standard deviation of 3.85 and 2.57 respectively, compared closely with the Group II mean and standard deviation of 3.27 and 3.05. It is evident in Figure 36 that group ranges were also similar with

Group I ranging from 0 to 10 miscues; and Group II, from 0 to 14.

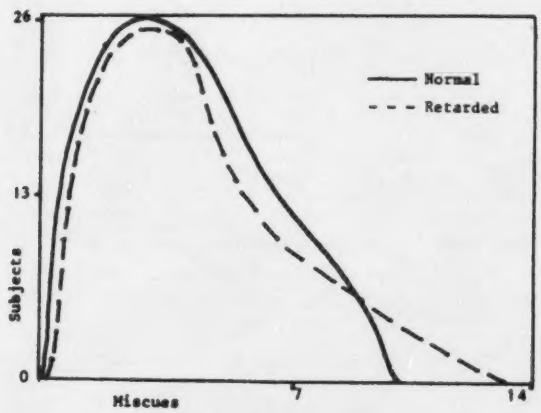

FIGURE 36
COMPARISON OF GROUP CURVES
GRAMMATICAL RELATIONSHIPS - OVERCORRECTION

The cumulative group percentages presented in Table 39 support the similarity shown in Figure 36. It is apparent that the distribution of the groups was similar with neither group displaying a tendency to overcorrect miscues.

TABLE 39
CUMULATIVE GROUP PERCENTAGES
GRAMMATICAL RELATIONSHIPS - OVERCORRECTION

READERS / CUM. %	NUMBER OF MISCUES											MEAN*	S.D.
	0-1	2-3	4-5	6-7	8-9	10-11	12-13	14-15					
Group I READERS	4	10	6	4	1	1						3.85	2.57
Group I CUM. %	15.4	53.8	76.9	92.3	96.2	100.0							
Group II READERS	7	10	5	2	1			1				3.27	3.05
Group II CUM. %	26.9	65.4	84.6	92.3	96.2			100.0					

*A difference between the groups at the .47 level was not considered significant.

Intra-group Comparison:
Grammatical Relationships

The efficiency with which a reader employs grammatic cues, semantic cues, and correction strategies is of vital concern to educators. The level of efficiency helps to determine the success that a student has in gaining meaning from reading material. The intra-group analysis of Grammatical Relationships compared the total of each subcategory with the total number of group miscues. In the present study, this analysis revealed differences between the groups in their ability to utilize these reading strategies. A summary of group percentages is presented in Figure 37.

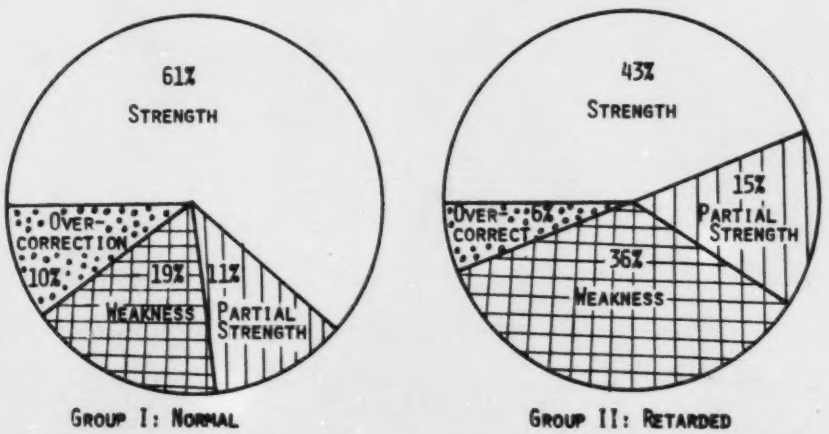

FIGURE 37
INTRA-GROUP PERCENTAGES
GRAMMATICAL RELATIONSHIPS

It is evident that normal readers displayed more ability to couple semantic and grammatic cues with efficient correction strategies than did retarded subjects. Sixty-one percent of the miscues of normal readers fell in the Grammatical Relationships - Strength subcategory, while only forty-three percent of the miscues of retarded readers were so classified.

The Partial Strength subcategory represented the use of grammatical cues with a disregard for meaning and an ineffective use of correction strategies. Although group percentages were similar, the retarded readers had slightly more miscues in this classification. This tendency supported the concern voiced by Jordan (1969) that despite the fact that retarded students adequately utilize decoding and other "rule-based" skills, they often read with no expectation of meaning from the text. Behavior that could exemplify readers in this category was aptly described by Jordan as reading with "gaps in understanding, misconceptions, loss of detail, and sometimes loss of main ideas," or having to "reread in order to answer questions, getting meaning only when they have received a set to look for a particular point (p. 133)."

There was a greater incidence of miscues by mentally retarded readers in the Weakness subcategory of Grammatical Relationships. Unfortunately, this weakness could be characteristic of many retarded readers who are able to decode and/or recognize words far above their ability to gain meaning from the text (Jordan, 1969). In her analysis of reading comprehension for retarded readers, Jordan deplored this weakness as a product of teaching. Some theorists might attribute this reading characteristic to the inability of the retarded to deal with abstractions of language; however, this inability should not be generalized to all retarded students. Because of the heterogeneity of the mentally retarded, it is imperative not to discount a retarded student's potential to read with comprehension. Based on research (Hargis, 1972; Levitt, 1970; Ramanauskas, 1972; and Semmel, Barritt & Bennet, 1970), the retarded have demonstrated an ability to utilize grammatic and semantic cues in reading; and it appears that direct teaching is likely to improve these abilities.

Overcorrection of miscues appeared to be more prevalent among normal readers. Although subjects for this study were chosen to represent a variety of teaching

approaches, it is possible that the tendency of normal children to overcorrect miscues was affected by instruction which emphasized exactness in oral reading. Coupled with their awareness and self correction of miscues, the normal readers could have been motivated to correct miscues for the sake of being "correct" rather than "efficient."

From the group comparisons in this category, it was evident that both groups exhibited an ability to utilize grammatic cues, semantic cues, and correction strategies in reading. There was a difference, however, in the extent to which these cues were used. The normal readers appeared to combine these reading strategies more effectively than the retarded readers with a greater percentage of miscues classified in the "Strength" sub-category. The retarded readers had a slightly higher percentage of miscues in the Partial Strength category depicting a tendency to use grammatic cues to the exclusion of meaning and correction strategies. In addition, the retarded readers had a much greater incidence of miscues in the Weakness category, indicating a general inability to employ reading strategies effectively in gaining meaning from the text. It appears, then, that although the retarded readers did exhibit some skill in utilizing grammatic, semantic, and correction strategies,

the normal readers were able to employ these strategies with more efficiency and consistency in their oral reading.

Discussion

The major question of this study investigated the oral reading patterns of normal and mentally retarded readers who were reading between the 2.0 and 3.9 levels to determine whether or not the groups exhibited similar patterns of miscues as assessed by the Goodman Reading Miscue Inventory.

Prior to answering the major question of the study, it was necessary to examine each category of the Goodman RMI to determine whether specific reading strategies differentiated mentally retarded and normal readers. These analyses, as delineated by the subquestions of this study, were reported in the first portion of Chapter IV. The data are now compiled to address the major question.

Two comparisons were made in this study. Comparison I was an inter-group comparison in which an analysis of variance was run between the aggregate raw scores and a t-statistic was applied in each subcategory of the RMI to determine whether significant differences existed between the groups. Comparison II was an intra-group

analysis which compared the aggregate totals of each subcategory to the total number of miscues or substitutions made by each group. This analysis produced percentages which provided insight into the reading strategies used by both groups.

Comparison I

A t-statistic was applied to the aggregate group means in each subcategory of the RMI to determine whether a significant difference existed between the groups. A significant difference was evident in all categories except Correction-Yes, Correction-Partial, Semantic Acceptability-Yes, Meaning Change-No, Comprehension-No Loss, Grammatical Relationships-Strength, and Grammatical Relationships-Overcorrection.

The Goodman RMI is designed to provide a comparison of percentages within each subcategory, which in turn provides insight into the effectiveness of reading strategies used by the reader. The results of Comparison I could be misleading, since aggregate subcategory totals of Groups I and II were compared only to each other with no consideration of the total number of miscues or substitutions made by the groups. The fact that retarded readers made more miscues than normal readers, then

affected the results of the comparison and made it impossible to assess the reading behavior patterns of the groups solely on the basis of Comparison I. To obtain a more accurate picture of the groups, it was necessary to take into consideration the total number of miscues of the readers.

Comparison II

The relationship of subcategory totals to total miscues was determined in Comparison II. It was apparent from Comparison II that both similarities and differences existed between the groups in the reading strategies which they employed. The mentally retarded and normal readers displayed similar abilities in utilizing graphic and sound cues to identify unknown words. Likewise, group percentages were similar in the Grammatical Function category, which tapped the reader's ability to substitute single words of the same grammatical function for the stimulus word of the text.

Both groups appeared to leave a majority of their miscues uncorrected; however, normal readers tended to correct a greater percentage of miscues than the retarded. It was interesting to note that some of these corrections contributed to a higher incidence of "overcorrections"

for the normal readers indicating that they sometimes employed inefficient correction strategies.

The grammatic and semantic acceptability categories of the Goodman RMI revealed differences between the groups in their ability to utilize grammar and meaning cues in reading. The normal readers appeared to produce more sentence structures which were grammatically and semantically acceptable in the entire context of the selection. In contrast, the percentage of responses that were completely unacceptable was higher for the retarded subjects in both categories.

Comprehension percentages, which represented a comparison among correction, semantic acceptability, and meaning change factors, revealed differences between the groups in the amount of comprehension loss that occurred because of miscues. The retarded readers exhibited a greater tendency to make meaning-changing miscues. In addition, it appeared that normal readers were more sensitive to the concern that their reading sounded like language than were retarded readers. It was evident that not only did retarded readers make more meaning-changing miscues, but they also failed to utilize grammatic cues

and correction strategies to regain comprehension of the passage.

There was an apparent difference between the groups in the Grammatical Relationships category in which correction, grammatic, and semantic acceptability factors were compared. While normal readers showed a greater ability to combine meaning and grammatic cues with appropriate correction strategies, retarded readers exhibited a greater tendency to utilize grammatic cues to the exclusion of meaning factors. In addition, the retarded group's percentage of miscues was double that of the normal group in the subcategory which portrayed a failure to use grammar, meaning cues, or correction strategies.

The summary of the analysis conducted in Comparison II of this study indicated that both normal and mentally retarded readers appeared to utilize the reading strategies tapped by the Goodman RMI. It was apparent, however, that there were differences between the groups in the degree to which these strategies were used. Although both groups functioned in a similar manner in the utilization of graphic, sound, and grammatical function cues, the normal readers exhibited greater efficiency in their ability to combine grammatic and semantic cues with efficient correction strategies.

CHAPTER V

SUMMARY, LIMITATIONS, CONCLUSIONS AND IMPLICATIONS

Summary

Background and Purpose

The purpose of the present study was to investigate the oral reading miscue patterns of mentally retarded and normal children who were reading between the 2.0 and 3.9 levels.

The relationship between oral language competence and reading has been consistently reported in the literature. Because of this relationship, reading theorists indicate that the child's language patterns should be utilized as a foundation and reinforcement for reading instruction. Because language does provide the structure for reading, it may be assumed that those children who are not proficient in language skills also exhibit difficulty in learning to read.

Because of the relationship between language and reading, consideration should be given to language factors when assessing competence in reading. A simple quantitative tallying of errors does not tap the reader's involvement with the language of the text. To assess this aspect of reading skill, a qualitative evaluation of miscues

is necessary to determine the extent to which departures from the text interfere with comprehension of the selection.

Language development has been recognized as a major area of deficit for mentally retarded children, with language competencies lagging far below those of their normal age peers. Research (Lenneberg, 1967; Miller & Yoder, 1975; Naremore & Dever, 1975) indicates that although the level of language skills of the retarded is not comparable to that of normal children, the developmental patterns are similar, with the mentally retarded developing at a slower rate. The language development patterns of mentally retarded children, therefore, appear to be more consistent with the patterns of normal children of approximately the same mental age.

Because the language development patterns of retarded children are similar to those of normal children of the same mental age, and because those language patterns affect reading competence, it would appear reasonable that children reading at a similar level would exhibit similar patterns of reading. The Goodman Reading Miscue Inventory, designed to evaluate the reader's involvement with the language of the text, was utilized to investigate this possibility.

This study was designed to investigate one major question:

> Do mentally retarded readers exhibit similar patterns of oral reading miscues as assessed by the Goodman Reading Miscue Inventory as normal children who are at a similar reading level?

Because of the construction of the Goodman RMI, an investigation of the major question involved prior consideration of several subquestions:

1. Is there a significant difference in the utilization of graphic cues in decoding unknown words?
2. Is there a significant difference in the use of phonetic cues in decoding unknown words?
3. Is there a significant difference in the match of grammatical function in word substitution?
4. Is there a significant difference in the frequency of miscue correction?
5. Is there a significant difference in the grammatical acceptability of the miscues produced?

6. Is there a significant difference in the semantic acceptability of the miscues produced?
7. Is there a significant difference in the degree of meaning change caused by the miscues?
8. Is there a significant difference in patterns of comprehension in terms of no loss, partial loss, and loss?
9. Is there a significant difference in patterns of grammatical relationships which result in reading strengths, partial strengths, weaknesses, or overcorrections?

Related Research

The review of literature was divided into four categories: the development of language skills and their relationship to the reading process, a comparison of the language development patterns of mentally retarded and normal children, the utilization of the cloze procedure in determining the use of context cues by mentally retarded and normal readers, and a comparison of the synthetic and analytic approaches to reading instruction.

Initially, the relationship between language skills

and reading was established. Language is fundamentally a product of the interaction of an individual with his environment and a generalization and internalization of language rules based on this interaction. Reading, as an integral part of the language arts, is dependent upon the individual's competence with the structure of language; therefore, success in reading is directly related to language skills.

In a comparison between the language development patterns of mentally retarded children and normal children, several areas of similarity were noted. At younger mental ages, there appear to be few qualitative differences between mentally retarded and normal children of the same mental age. Mentally retarded children show increased language competence and a decrease of errors in relation to an increase in their mental age. It is apparent, however, that mentally retarded children are not as able as normal children to deal effectively with abstractions of language.

The ability of mentally retarded children to utilize context cues was reviewed. It is evident that mentally retarded children do make use of context cues, and that these cues are not limited to the sentence level, but rather extend further to make use of the contextual organ-

ization of the entire selection. The use of context cues appears to be dependent upon several factors, namely, the strength or ambiguity of the context, the position of the deleted word in the sentence, and the sentence structure of the selection.

The effectiveness of synthetic and analytic approaches to reading instruction was assessed. Both normal and retarded children exhibit better word recognition and greater transfer of training when taught by the synthetic approach. If the goal of reading were simple decoding, it would appear that the synthetic approach would be the more effective method to use. Decoding is not, however, the ultimate goal of reading, but rather, the reader must interact with the language of the text to gain meaning. Because of the inability of the mentally retarded to learn incidentally, it is imperative that they receive direct instruction designed to assist them in utilizing their language skills to comprehend the reading selection. It is this ability of mentally retarded and normal children to utilize language skills in reading which is analyzed and compared in the present study.

Method

To determine whether or not similarities exist between the oral reading miscues of mentally retarded

children and normal children reading at a similar level, the Goodman Reading Miscue Inventory was utilized to analyze miscues made by both groups.

Subjects for the study were selected from five school districts located in southeastern Wisconsin. All subjects were reading between the 2.0 and 3.9 reading levels as determined by group or individual achievement tests. The normal readers of Group I, thirteen boys and thirteen girls, were selected from first, second, and third grade classrooms. The mentally retarded readers, sixteen boys and ten girls, were chosen from primary, intermediate, and junior high school classes for the educable mentally retarded. Classrooms from which the subjects for both groups were chosen encompassed a variety of teaching methods and materials, namely, language experience, synthetic phonics, Initial Teaching Alphabet, and basal reading series.

Each subject read during one testing session three identical selections which he had never seen before. The selections ranged from beginning first grade to beginning second grade level of reading difficulty as determined by an application of the Fry readability formula. Oral reading of each subject was tape recorded and an analysis of the miscues was conducted at a later time with this

researcher serving as the sole evaluator of the reading.

Miscues were recorded on the RMI Coding Sheet and analyzed according to specified criteria in the areas of sound similarity, graphic similarity, grammatical function, correction, grammatical acceptability, semantic acceptability, and meaning change. Patterns of comprehension and grammatical relationships were determined by a comparison of several subcategories of the RMI.

Each subcategory of the RMI was totaled and aggregate totals were computed for both groups. Subcategory totals were then compared to either total group miscues or total group substitutions to obtain a group percentage for each subcategory.

Two comparisons were made between the groups. Comparison I, an analysis of variance of the aggregate raw scores of each subcategory was run between the raw scores. A t-statistic was applied to determine whether a significant difference existed between the groups. Comparison I provided an inter-group analysis of the similarities and differences between mentally retarded and normal readers on a group basis. Comparison II compared subcategory totals to the total number of group miscues in each RMI category. The resulting percentages provided an intra-group analysis which offered insight

into the reading strategies used by the groups.

Results

The results of Comparison I indicated that significant differences existed between the aggregate means of mentally retarded and normal readers in all areas of the Goodman RMI except Correction-Yes, Correction-Partial, Semantic Acceptability-Yes, Meaning Change-No, Comprehension-No Loss, Grammatical Relationships-Strength, and Grammatical Relationships-Overcorrection. This analysis compared the groups solely on the basis of subcategory totals with no consideration of total number of miscues.

The relationship of group subcategory totals to total miscues was assessed in Comparison II. This comparison offered a more accurate picture of the reading strategies utilized by both groups. The findings of this comparison indicated that mentally retarded and normal readers displayed similar abilities to utilize sound and graphic cues in decoding unknown words. In addition, both groups substituted single words of the same grammatical function to a similar degree. Normal readers, however, appeared to correct more miscues than did retarded readers and appeared more proficient in producing grammatically and semantically acceptable structures when reading.

Mentally retarded readers exhibited a tendency to

make a greater number of meaning-changing miscues; as a result, retarded readers produced a greater percentage of structures which caused partial or complete loss of comprehension of the selection.

Normal readers showed a greater tendency to utilize meaning and grammatic cues and to correct miscues efficiently, while the retarded readers tended to use grammatic cues while often ignoring meaning factors.

Although differences did exist between the groups, it was apparent that mentally retarded readers were utilizing the reading strategies tapped by the Goodman RMI. The majority of these reading strategies, however, were not used as efficiently by the retarded group as by the normal readers.

Limitations

The following limitations should be considered when evaluating the conclusions of this study:

1. The sample size of the study was small; therefore, the results cannot be generalized beyond the present population. In addition, were the present population to be studied at a different point in time, they would represent different reading levels and reading skills, thus affecting the miscues and reading patterns exhibited.

2. Subjects were not matched on the basis of specific reading levels measured by one instrument. If reading levels had been more closely matched and if a single measurement instrument of reading ability had been utilized, the results of the present study could have been affected.

3. No assessment of the language development characteristics of the subjects was made. It is conceivable that had the groups been matched on the basis of language competencies, the RMI analysis could have yielded different results.

4. Although provision is made in the Goodman RMI for story retelling as a further assessment of comprehension, that aspect of the reader profile was not utilized as part of this study. It is apparent that story retelling would provide additional insight into the ability of the groups to gain meaning from the selection.

5. This researcher was the sole evaluator of the reading samples of this study with no provision made for a measurement of intra- or inter-judge reliability factors.

4. Normal readers correct a greater percentage of miscues than retarded readers correct.

5. Normal readers exhibit a greater ability to utilize semantic and grammatic cues in identifying unknown words.

6. Retarded readers make a greater number of meaning-changing miscues than normal readers.

7. Retarded readers exhibit a greater loss of comprehension than normal readers.

8. Normal readers exhibit an efficient use of grammatic and semantic cues coupled with appropriate correction strategies.

9. Retarded readers exhibit an efficient use of grammatic cues to the exclusion of meaning cues and effective correction strategies.

10. Retarded readers utilize the reading strategies tapped by the Goodman RMI; however, they do not utilize them as efficiently as normal readers who are reading at a similar reading level.

Implications

The present study was designed as a preliminary study which would provide basic information regarding the reading miscue patterns of normal and educable mentally

retarded students who were reading between the 2.0 and 3.9 levels. Implications based on the findings of this study are classified in the following areas: evaluation of reading, methods of instruction, reading materials, and further research.

Implications for Evaluation of Reading

To obtain a realistic picture of a child's reading skills, an assessment of his interaction with the language of the text is vital. Based on previous research findings (Hargis, 1972; Levitt, 1970; Ramanauskas, 1972; Semmel, Barritt & Bennett, 1970; Vandever & Neville, 1973), the groups of readers compared in this study could be expected to exhibit similar abilities if isolated reading skills had been evaluated. It is evident from the present study, however, that when these isolated skills had to be integrated in the reading process, there was a differentiation between the groups in their ability to apply these isolated skills effectively in reading. When reading is evaluated as a total process rather than as a summary of isolated factors, a completely different result can occur.

The mark of an efficient reader (Goodman, 1972) is the ability to select from a repertoire of skills, the minimal number of cues necessary to identify unknown words. This assumes that the reader has mastered these skills

so he can utilize them as necessary when reading. The mastery of isolated skills is not the determiner of reading success, but rather, the application of these skills in the reading process. An evaluation of reading, then, must take into consideration all aspects of reading, assessing both the components of reading and the total process.

Although the Goodman RMI is subjective in its approach to reading evaluation, it provides an insight into the reader's use of language cues in reading. This evaluation, coupled with an assessment of specific reading skills, can provide an overall picture of the student's ability to integrate reading skills to gain meaning from the text.

Implications for Methods of Instruction

Literature in the area of mental retardation (Jordan, 1969; Kirk, 1940; Robinson & Robinson, 1965) indicates that the mentally retarded are not able to learn material incidentally. Direct teaching is, therefore, necessary to insure the development of specific skills. The emphasis which has traditionally been placed upon phonics, sight words, and grammatical function in classrooms for the mentally retarded is apparent in the findings of this study. The mentally retarded readers demonstrated

competence in these areas, with both groups utilizing these cues to a similar degree in their reading. The success of direct teaching of these skills is apparent.

Based on the findings of the present study, it is evident that the mentally retarded need direct instruction in the use of grammatic and semantic cues to gain meaning from their reading. Jordan (1969) has indicated that teachers place much emphasis on individual skills in phonics and sight vocabulary with little or no direct instruction in reading comprehension. Because of their competence with oral language and their past experiences with books, children with average intelligence need little more than a reminder that they are to gain meaning from the text (Jordan, 1969). This ability cannot be assumed in the retarded. An emphasis needs to be placed upon an integration of isolated skills into a total process which will allow the reader to use his knowledge of grammatical structures and semantic cues to check the appropriateness of his responses.

The heterogeneity displayed by the mentally retarded readers in this study emphasizes a need for individualized instruction. Reading instruction for the mentally retarded must not categorize all readers as needing a particular type of instruction simply because they are

classified as "educable mentally retarded." A complete in-depth evaluation must be undertaken to determine which skills a reader is deficient in and the degree to which the reader is able to integrate these skills in an efficient manner to gain meaning from his reading.

Implications for Instructional Materials

Because reading represents a search for meaning in which language cues can be used to check the appropriateness of responses, it is imperative that reading materials approximate the language patterns of the reader. Reading materials that represent uncommon grammatical structures with little or no meaningful content can actually destroy the concept that reading is a search for meaning. It is important, therefore, that reading materials deal with situations and concepts that readers can relate to. It is equally as important that the language patterns are not stilted, but reflect those of the reader.

It is necessary to provide the reader with the opportunity to utilize reading skills within a meaningful context. The language experience approach is an effective method of teaching reading, since the reader's language is used. Comprehension is inherent, because the reader was involved in the experience, and skills can be taught in the context of a meaningful story.

Implications for Further Research

Because the present study was designed as preliminary research, several research topics have emerged as a result of the present findings.

Although an attempt was made in the present study to select students representing a variety of instructional methods, it is apparent that teaching methods did affect the types of miscues made by the readers. Research is warranted in the area of reading instruction to determine how specific methodology affects the types of miscues made by the reader. A multi-group comparison could be utilized to determine whether specific types of instruction are more effective with normal readers rather than with the mentally retarded, and the extent to which the instruction affects comprehension levels.

In addition to the effect of instructional methods, reading can also be influenced by the reading materials utilized. More information is necessary regarding the effect that specific materials have upon reading and the ability of the reader to integrate reading skills to gain meaning from reading. Concerns such as language patterns, appropriateness of content, difficulty of sentence structure, and readability levels must be investigated to determine their influence upon group performance.

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